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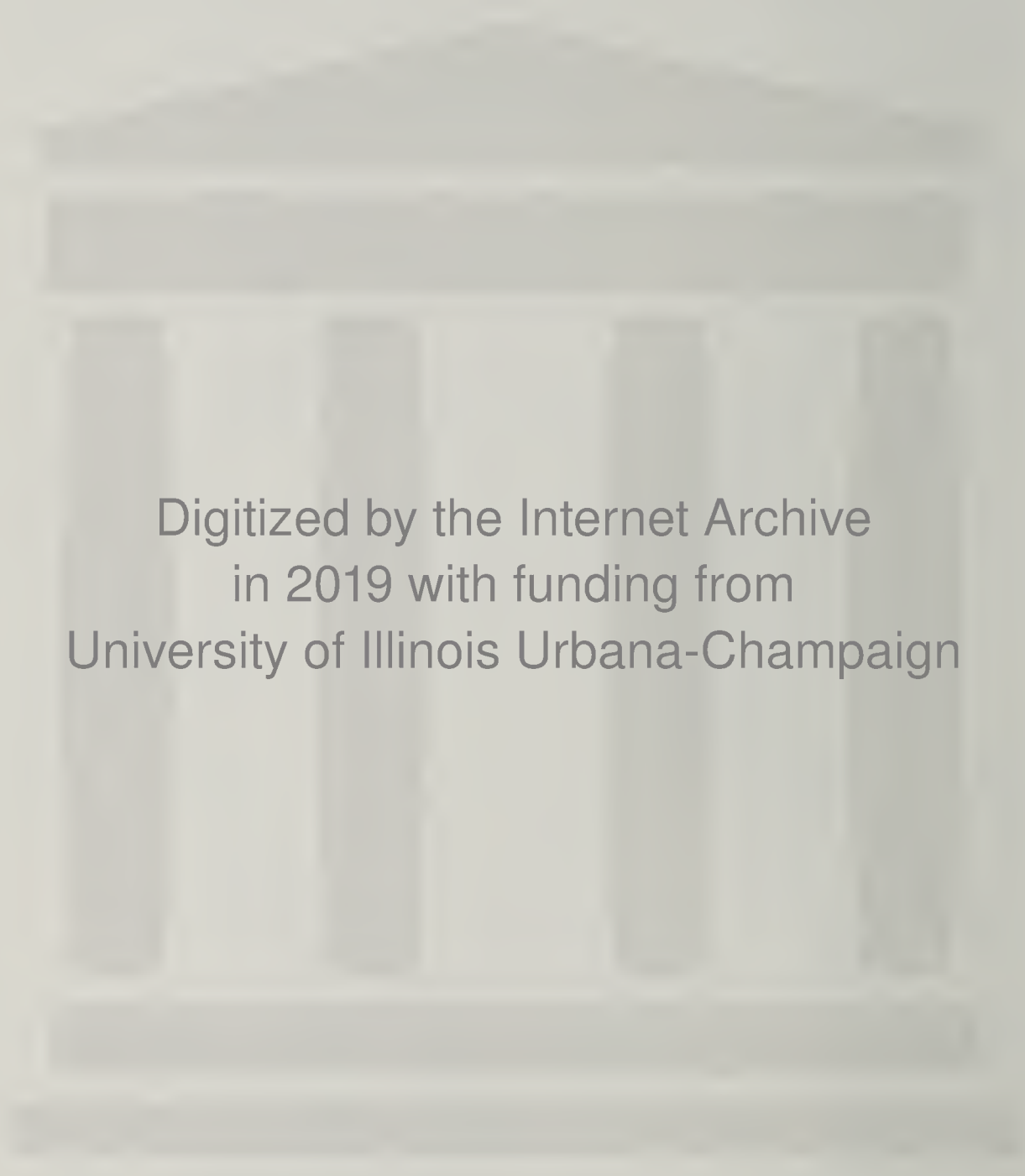
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No. 1.

ORIGINAL ARTICLES.

THE SURGICAL TREATMENT OF IMPERFORATE HYMEN.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-Second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5, 1891.

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In looking over the ordinary text-books in the hands of practitioners and students of the present day, you will find that the subject of imperforate hymen is passed over in most imperfect and unsatisfactory manner. By a strange coincidence, a professional colleague had asked my opinion regarding a case that died after operation for this condition, and in a day or two I was sent for by another physician to see the following case:

Mrs. F. H., æt. 20, seen July, 1890. Been married for sixteen months. Looked flushed. Has never menstruated. Suffers from spasmodic pains like labor pains. Was much worse last night than she has been yet. Her mother has been dead for some years, and she therefore refrained from consulting any one about herself. For four years she has felt pains like those experienced by her friends when they are unwell. They come on irregularly every two or three months. Has noticed a gradually increasing swelling over lower abdomen. The cramp-like pains have only come on recently. Would never permit her doctor to examine her, though after marriage she thought all was not right. Had difficulty in passing water. On examining the abdomen I felt what I took to be the uterus $1\frac{1}{2}$ inch above the umbilicus, and readily diagnosed imperforate hymen with retained menses.

After telling the husband of the dangers of operation, and after removing her into the hospital, I passed in a trocar, then cut out a circular piece of the $\frac{1}{4}$ -inch thick hymen, and before allowing much of the fluid to escape, inserted the nozzle of a syringe attached to a well elevated douche pail. In this way a large quantity of water was run in, until all the treacly discharge had been washed out, and with it large flakes of dead vaginal epithelium. While the cavity was

still distended with fluid, I began to pack it full of iodoform gauze, and as the gauze was packed in the water of course came out. No pressure was allowed above on the abdomen. This was all done with the patient anæsthetized, so that I could work under the most favorable circumstances. I stitched with a continuous suture the mucous membrane on the internal and external surface of the hymen, so that the subsequent passage of gauze would be more readily accomplished. The cavity of the pelvis was thus filled with gauze. This was only removed and renewed every forty-eight hours. After each removal the parts were thoroughly douched. The parts below were covered with an absorbent antiseptic pad. The patient was kept in bed for two weeks, and was never allowed to sit up. There was no rise of pulse or temperature, and her pains were at once relieved. She was not allowed to do any work for one month, and was specially warned against straining or lifting.

A peep into the aforementioned text-books may make such details appear unnecessary, but the sad experience of my colleague with his case terminating fatally, as it did within a few blocks of the hospital during the same week, made me extremely cautious. The fatal case improved, and was allowed to sit up on the seventh or eighth day; sudden pain seized her and she developed symptoms of acute peritonitis. In a short time she was a corpse. This death impressed on my mind the necessity of following out two points in the treatment:

1. A replacement of the fluid by something that will be antiseptic, soft and unirritating, harmless, and that will afford good drainage and sufficient support.

2. That when sudden symptoms occur at a late period from sitting up, sudden straining, coughing, etc., the quicker the patient's abdomen is opened and drained the better. Such cases have tubes that have ruptured or leaked on account of a disturbance of their adhesions.

Such a treatment is to my mind an ideal one. The patient must be anæsthetized to carry it out. Her abdominal muscles will thus be relaxed, and the tension on the pent-up fluid will be lessened. The orifice in the hymen can be thoroughly dilated, and a small speculum can be introduced to

facilitate the washing out and the packing with gauze. If the gauze is put in as it should be, in one continuous strip, it can readily be removed.

Should the symptoms of sudden rupture of some adhesions of the tubes, or escape of fluid through the tubes set in, with peritonitis, I should at once open the abdomen and look for the source of the trouble. Dilated, diseased tubes should be removed, and the abdomen washed out. One must, however, distinguish between the symptoms that are due to a *septic* inflammation affecting vagina, uterus, tubes, ovaries and peritoneal cavity, ascending from below, and peritonitis due to ruptured adhesions or escape of fluid into the peritoneal cavity. In the septic cases the vagina becomes tender and thickened, the uterus enlarged, tender and soft, cervix swollen, and the whole uterus appears as it does just after a labor is terminated. These cases simulate the ordinary cases of septic fever subsequent to labor, or our puerperal fever. One such has been recorded by Sir J. Y. Simpson. In the other form of 'complication' the symptoms are sudden in onset and follow some indiscretion. Opinion as to the best surgical procedure in these cases of imperforate hymen is probably even yet divided. These cases usually fall into the hands of the general practitioner, and he is called upon to relieve them. He should, therefore, be perfectly familiar with the dangers to be met and the best methods of avoiding them. Let him take to heart the warning of Sir J. Y. Simpson: "Beware of making light of such a case to the patient's friends, and beware above all of telling them that the operation you are about to undertake is either harmless or trivial."

Let him remember that Dr. Matthews Duncan advises that the patient should be kept in bed for three or four weeks after the operation, to avoid the increase of intra-abdominal pressure that accompanies the erect posture. Any one who is skeptical as to this pressure may readily satisfy himself by watching the changes in a column of water communicating with the bladder through a catheter, during the recumbent and then during the erect position.

In these cases Barnes, that best of gynecological writers, says: "A free external outlet would make it easier for the contracting uterus to expel its contents by this route, and thus take off pressure towards the tubes. On the other hand, the rapid retreat of the uterus would favor the laceration of the tubes if held back by adhesion. The balance of advantages and disadvantages of either plan is difficult to strike; and it is to be apprehended that cases will continue to occur in which a fatal result will follow any method of treatment." Barnes and Simpson give very sound and practical opinions on this subject. Simpson and Matthews Duncan advise against washing out the cavity, while Barnes says that he is not quite

sure but that free incision and washing out is the best plan. Tait is in favor of washing out after free incision. He reports six cases done in this manner, and four done by the gradual method, without any fatal case. Emmet records four cases with four recoveries, but gives no details.

I have run through as much of the literature of this subject as I can command, and hoping that others may follow with more extensive lists, I have constructed a rough table of thirty-six cases with three deaths, a mortality of 8 per cent. The operation thus ranks with some of the most serious in surgery. I do not count the case of Thompson, where the condition was not discovered until after death from another cause, viz.: miliary tuberculosis. Four cases had subsequent severe peritonitis, to which two succumbed. Two had subsequent severe septicæmia, to which one succumbed. Again, to classify these differently, one died after free incision from peritonitis, produced by escape from the tubes. One died after free incision, washing out and apparent recovery, from some internal rupture and peritonitis. One died from septicæmia after the gradual method of evacuation, without washing out. One had severe peritonitis after the gradual method of evacuation, with recovery. One had severe peritonitis after the rapid method with washing out done twenty-four hours after, with recovery. One had severe septicæmia after the rapid method and washing out, with recovery.

Eight cases of the gradual method are recorded, against twenty-four of the rapid method.

In four cases the patients complained of dysuria. In three retention of urine was a prominent symptom. In one of the cases mentioned by myself a doctor was called in on a previous occasion, diagnosed retention of urine, and passed the catheter. The true condition was not recognized. This also happened in Drysdale's case.

Attention was usually called to the tumor when about the size of the gravid uterus at five months.

The effect of heredity is spoken of by Yates. He cites two cases occurring in two sisters and in two cousins of these two sisters. From what follows regarding the curious freaks of nature in his district, one concludes that it must be a curious hunter's paradise, and the record loses weight.

But the strangest freak of all is to read in the "American System of Gynecology," that the prognosis is always favorable unless the patient has already had intra-pelvic hæmorrhage. I hope the writers of text-books will grant more than four and one-half lines to this subject. Cases are few and far between, and therefore our practitioners should be in possession of all the facts concerning them.

My ideas, then, as to the proper method of procedure, are as follows.

1. Warn the husband or friends of the danger of the operation.

2. Give the patient an anæsthetic.
3. Incise and tear the hymen freely.
4. Wash water in at once to take the place of and to wash out the blood and *débris*, and wash until the water comes out clear. Several quarts will be required.

TABLE OF OPERATIONS]

By Whom and Where Reported.	Number.	Retent. of Urine.	Method of Operative Procedure.				Recoveries.	Deaths.	Complications.
			Gradual	Rapid.	Incision Later.	Washed out at once.	Not washed out at once.		
Yates, London Lancet, June 11, 1870	1			Incision					
Davis, Medical Times and Gazette, Dec. 19, 1868.	1			Free Incis.		I			Peritonitis.
Phillips, Medical Times and Gazette, Dec. 19, 1868.	1			Free Incis.		I		I	Escape from tubes.
Hall, Medical Times and Gazette, Dec. 19, 1868.	1			Free Incis.		I			Severe peritonitis.
Copenian, Med. Times and Gazette, Dec. 19, 1868.	1				in 8 days				None.
Drysdale, Lancet, Dec. 11, 1869.	1	I		Free open.			I		
A. Walker, N. Y. Obstet. Soc., June 3, 1884.	1					I			
Watts, N. Y. Obstet. Soc., June 3, 1884.	1			I					
Bigelow, Medical Record, December 15, 1888.	1	I		I					
Walker, Chic. Med. Journal, 1878.	1	Dysuria		I					Miliary tuberculosis.
Reamy, Trans. Obstet. Soc., Cincinnati, Oct., 1888.	1			I					
Jones, Trans. Obstet. Soc., Cincinnati, Oct., 1888.	1		*						
Thompson, Lancet, 1876.	1								
Somers, Lancet, May 19, 1890.	1			I					
Railley, Bost. Med. and Surg. Jour., 1876.	1			I					
McCallum, Can. Med. Surg. Jour., Jan., 1880.	1	Dysuria	†	I					
Glaister, Glas. Med. Jour., Nov., 1880.	1	Dysuria		I					Epilepsy and septicæmia.
Latimer, Brit. Med. Jour., June 28, 1884.	1			I					
Sykes, Brit. Med. Jour., April 19, 1890.	1				in 6 days				Peritonitis.
Allinson, done in 1797 by Mr. Smith.	1	I		I			I		Septicæmia.
Tait, Brit. Med. Jour., April 5, 1890.	10		4	6		24 hrs. after		10	
J. Y. Simpson, Dis. of Women.	1		I						
Finniet, Dis. of Women.	1								
Russ, Dis. of Women.	4	Dysuria				I		I	
Colleague's case.	1			I		I			Peritonitis 8-10 days after.

† Had opened previously and closed again.

* Not discovered until after death from tubercular meningitis.

5. Pack the cavity full of iodoform gauze. Use no compression on the abdomen.

6. Stitch the internal and external mucous surfaces of the hymen together.
7. Apply an antiseptic pad to the genitals.
8. Remove the gauze in forty-eight hours, wash out cavity, reapply gauze.
9. Keep the patient in the recumbent posture for two weeks, and in bed or on a sofa for a week or ten days longer.
10. If symptoms pointing to ruptured or leaky tube, with accompanying peritonitis, set in, open the abdomen, remove the cause of the peritonitis if possible, wash out the peritoneal cavity, and drain. To be successful this must be done early.

HYSTERORRHAPHY.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5-8, 1891.

BY WM. RAWSON CHUNN, M.D.,
OF BALTIMORE, MD.

During the past few years, many things have been accomplished by the medical profession, having in view the prevention as well as the amelioration of suffering in mankind. I take pleasure in going a step farther, and doubt not that all rejoice with me when I say the same is true in regard to womankind. It is not necessary to mention by name all the advances in this direction, as time alone prevents, but by way of example we may say, without fear of contradiction, the barren woman is made to bring forth children, and she that had an issue of blood is healed of her infirmity. I need say no more by way of compliment, than that which was heretofore assumed to be miraculous is now nothing more than natural, and known to all. These results have been accomplished both by accident and design. Opportunity, quickness, manual dexterity and wealth, may be considered among accidental advantages. Out of these, however, proceed familiarity, confidence, experienced judgment, and last of all, design.

The histories and operations mentioned here are, to most of us, not at all novel or in any way startling. Although genius deserves, and sometimes obtains, credit for creating the brilliant and original, it is, fortunately, left for each member of the profession to try the experiment for himself; and thus, by the aggregate of individual effort, a true judgment is finally reached as to how much benefit is conferred upon humanity at large. Each one, then, has the right to give the result of his experiments, be they successful or otherwise, in order to make up this aggregate. For some time I had been looking out for a case where, in my judgment, it would be proper to attempt to cure a uterine displacement by fixation to the abdominal wall. It occurred to me, in order to prevent adverse criticism which might possibly be offered, that it would be well to select

a case where laparotomy was imperatively required otherwise than for the uterine malposition, such a case having hardly anything added to its gravity by the slight additional operation of fixing the uterus to the abdominal wall. It is here hardly necessary to state the various malpositions requiring the operation, except to mention posterior displacements, accompanied by persistent menorrhagia and metrorrhagia, continual miscarrying from retroflexion, distressing impaction of enlarged uteri in the pelvis, also not forgetting cases of decided prolapse and procidentia where the uterus descends between the thighs. About fifteen months ago, the case I had been looking for presented itself, and the following history was obtained: The patient was 28 years of age and unmarried, and had never been pregnant. For some two or three years past she had suffered greatly at her menstrual periods, and for nine months before I saw her she had been bleeding continuously. Of course, there were all sorts and kinds of pains in the pelvis. It was the bleeding principally, she wanted, however, to be cured of. Upon examination, the uterus was found enlarged and retroverted, and the ovaries could be distinctly felt, enlarged and tender, on each side. I considered Tait's operation would have to be done, but before resorting to the radical method, determined to dilate and explore the cavity of the uterus, and to use the curette, in hopes of relieving the neuralgia. This was accordingly performed, but resulted in no good, for the bleeding speedily returned, and was as bad as before the operation. I should say that it was impossible for the patient to wear a support, as the parts were entirely too sensitive to bear pressure. After some time had elapsed, and after the exhibition of the usual drugs with no change for the better, a day having been fixed for the operation, I repaired to the house of the patient and, with the assistance of Dr. E. M. Wise, Dr. L. E. Neale and others, prepared to take out the ovaries and tubes and stitch the uterus in the abdominal incision. The belly was laid open, and the tubes and ovaries were finally torn loose from their attachments and tied off on each side. Dr. Neale remarked that Tait's operation in this case was as justifiable as in any case he had ever seen. At this particular moment the patient ceased to respire, much to my discomfiture, and it was only by vigorous efforts that collapse was prevented. This accident, so to speak, "took my nerve," and instead of completing the operation after the manner of Kelly, by catching up the ovarian ligaments, I finished the operation by the following method. It is proper to state here, that the lower end of the abdominal wound was made as close down to the bladder as safety would permit. In stitching up this wound the first suture was introduced at the lower end of the incision, next the bladder,

and then carried directly through the top of the fundus of the uterus, and out again through the opposite lip of the abdominal incision at a corresponding point. In other words, this suture was simply the suture nearest the bladder, and which also held the uterus in its new position. It closed the lowest part of the abdominal incision, and anteverted and brought forward the uterus. A thin, straight needle was used, and a stout thread was threaded directly in the eye of the needle. By this means the thread was more easily carried through the dense uterine tissue, and the suture being somewhat larger than the needle, made sufficient resistance to prevent cutting out. At the same time, the thickness of the thread filled completely the track of the needle, and consequently there was no hæmorrhage. This ligature was composed of Chinese twisted silk, and in size was about as large as that usually used to tie ovarian pedicles.

There being no evidence of hæmorrhage in the pelvis, the rest of the incision was closed in the usual way. Drainage was thought inadvisable, as a tube, if close to the fundus, might have a tendency to prevent secure attachment to the abdominal wall. A vaginal examination was made immediately after the operation, and the cervix was found far back in the hollow of the sacrum, the body of the uterus lying on top of the anterior wall of the vagina and fast to the bladder end of the parietal incision. The patient was put to bed and allowed to empty the bladder at will, without the use of a catheter. She received no medicine and had no bad symptoms. The bladder performed its function normally and without irritation, and I did not see her again until the sixth day after the operation. I then removed all the stitches, with the exception of the suture holding the uterus, and found good union all along the line. After fourteen days the uterine ligature was also removed, the uterus still remaining in good position. The woman got out of bed at the usual time and began to go about, a pessary having been introduced as a precautionary measure. The support was kept in position about one month. The menorrhagia and metrorrhagia ceased at the time of operation, and have not since returned. This operation was done a year ago last January, and I did not see my patient again until March, 1891, fourteen months after she was operated upon. About the middle of last March she returned to the city, and I examined her at my office. The uterus was then found in normal position, slightly anteverted, with an attachment to the abdominal wall, which was somewhat movable. The cervix was back in the hollow of the sacrum, and the fundus could be plainly felt above the anterior vaginal roof. The traces of the abdominal incision had almost entirely disappeared. Menorrhagia and metrorrhagia had been entirely absent since the opera-

tion. Pain and other pelvic symptoms had disappeared, and the woman seemed restored to her usual state of health. Although uterus and vagina were undergoing atrophic changes, sexual desire was still present as before the operation, and she was not averse to marriage, provided a suitable party should make proposals.

I was interested to find that in this instance, where the uterus was kept in place after the operation, atrophy had taken place, whereas in another case, operated upon with the uterus left in a state of retroflexion, atrophy had not taken place as late as two years after the operation.

A number of procedures have been instituted by medical men within the past few years for the cure of posterior displacements of the uterus. Some of these, I think will be found useful, others will doubtless prove without avail and be cast aside. It always seemed to me important to eliminate from the field, as soon as possible, any operation unlikely to be attended with success, in order that as few patients as possible should run the risks, without some certainty of a satisfactory result. In this connection I may mention the method of passing a suture, or sutures, through both abdominal wall and uterus without doing laparotomy. For those who are not experts, this method may seem without difficulty and free from danger. In order, however, to raise the uterus sufficiently to make the fundus impinge against the abdominal parietes, so that the proper direction may be given to the suture, manipulation of considerable skill is necessary, and although no lives have as yet been lost, I do not think this operation is without danger. My friend, Dr. Howard Kelly, was the first, so far as I know, to try the above mentioned experiment, and he tried it right along in five cases, and after the ether, and it failed in every one. Now it strikes me that very few of us would have the courage to pursue such a course for such a length of time, and I feel like congratulating Dr. Kelly for eliminating from the field by his own efforts in such short order an operation destined to be of no benefit. It would be well if we could arrive at definite conclusions in regard to other operations with the same celerity. I should think the number of cases would be limited where the uterus could be stitched in place, without first opening the abdomen, retroflexion with adhesions in Douglas' cul-de-sac being a contraindication. It seems probable that some form of ventral fixation will in the future be the favorite means of treating the cases we are now considering, particularly as laparotomy is so many times imperative for other reasons. From the experience of others, as well as my own, I would not hesitate in any case to run a thread through the uterus and stitch it in the abdominal wound, where the abdomen had been opened on account of some more pressing emergency. I do not know what success has at-

tended the efforts of other operators by the use of a single suture, but if a single suture proves sufficient, it is all I ever expect to use. Reasoning from analogy, however, we should not expect too much from the operation. Sometimes the uterine stump, when treated by the clamp, after hysterectomy, will after awhile sever its connection with the abdominal parietes, although in such cases the attachment is most intimate. In hysterorrhaphy, however, the fundus and greater part of the uterus being present, the attachments may not have so far to stretch.

It seems hardly probable that a succeeding pregnancy would in any way interfere with the new position of the uterus (provided the ovaries and tubes remained normal), except, in fact, to lift it still higher up, and throw it further forward. When, for example, we consider how enormously the round ligaments lengthen during the last months of pregnancy, I think it safe to conclude that we can count on the same behavior of the uterine attachments after hysterorrhaphy. It is not my purpose here to give a detailed account of the operations embraced under the body of this paper, as the procedures are well enough known by this time to merit description in recent publications on that branch. It seems, however, that the different forms of operation may be divided mainly into two classes: 1. Those forms of operation where the supporting suture is passed through the round ligament, broad ligament, or ovarian ligament, etc., and then tied to the abdominal parietes; and 2, where the supporting suture is passed directly through the fundus of the uterus. It would give me pleasure to hear the opinion of the Association as to which of these forms is likely to prove most beneficial—and no matter which way the verdict stands, I shall be equally well satisfied.

TREATMENT OF ECTOPIC GESTATION.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY E. E. MONTGOMERY, M.D.,
OF PHILADELPHIA.

While it is important in every class of disease to have definite ideas as to the methods of treatment, it is particularly so in the condition under consideration. The obscure character of the symptoms often presented, the difficulty of diagnosis, the grave lesions resulting from development and rupture, render such cases so important, that time devoted to their consideration, even though it may lead to frequent reiteration, is not time lost.

A fierce conflict has been waged during the last few years between the advocates of surgical procedure and those who favor palliative measures. The latter class, recognizing the dangers

of a surgical procedure which necessitates the opening of the abdominal cavity, the separation of vascular adhesions, and the increased avenues for septic infection, have endeavored to seek some way by which they may be averted. To accomplish this, the general methods of procedure have been the injection into the sac, or into the fetus, of material which will bring about its death through poisonous action; or the destruction of its life by the application of the electric current. The first method of procedure has been the injection into the sac of morphine, chloride of zinc, and other agents. This plan of treatment, however, has been attended with such unpleasant results as a rule, that it is not now generally practiced. The injection of the chloride of zinc, has, however, been recommended during the past year as being an efficient method of destroying life and preventing further discomfort from the presence of the mass. The tendency of the development of suppuration and of inflammation extending to the surrounding structures, is such as to preclude its use. The procedure very frequently results in conditions which necessitate subsequent operation when the patient is far less able to undergo it.

Electricity has still many persistent and able advocates, who regard it as perfectly efficient in destroying the life of the fetus. There are, without doubt, many well authenticated cases in which its use has resulted in the death of the embryo and the arrest of its subsequent development. This being the case, it will be asked, why should not electricity be the agent we use for the treatment of such cases, rather than subjecting the patient to an operation, which, without question, is attended with a certain amount of danger. In answering this question we have, necessarily, to consider the progress of ectopic pregnancy and the difficulties in its diagnosis. It must be remembered that there is nothing in the earlier stages of ectopic pregnancy that would lead the physician, or even the patient, to suppose that the pregnancy was other than a normal one, and it is only when symptoms of danger threaten, and either partial or entire rupture has taken place, that the patient becomes aware of the gravity of her condition, and feels it incumbent upon her to consult a physician.

Rupture of the sac in a tubal pregnancy may take place at any time between the third and thirteenth weeks. In the earlier periods the first premonition the patient may have will be a tearing pain in the side, followed by a sensation of faintness, possibly repeated attacks of faintness or even fainting, and all the symptoms of internal hæmorrhage. In such a case the physician has no time for tentative measures, but must resort to a radical procedure in order to save the life of the patient. We have no reason to believe that the death of the embryo in the fetal sac in any

other portion of the tract would differ from that which takes place in the cavity of the uterus. Here, it is true, the fetus may die, may undergo the process of maceration and entirely disappear, but its envelope remains and may continue to retain its vitality for a number of months subsequently, before it is thrown off.

2. It is true the sac formed in the tube or ovary may not be so readily eliminated, but it remains an organized mass, which the organism of the patient must, sooner or later, be called upon to take care of, and hence it is likely to result in the development of trouble of such a character as ultimately to necessitate operative procedure for its removal.

3. Electricity, in cases in which the diagnosis is correct, is not an absolutely certain agent to destroy fetal life, but the embryo may continue to develop notwithstanding very strong currents of either galvanic or faradaic electricity have been used.

4. In many of the cases in which electricity has been used with a supposed successful result, it is doubtless true that the sac had already ruptured and the death of the fetus occurred, and the subsequent recovery of the patient was only the result of natural conditions, and not at all influenced by the application of the agent itself.

The writer was formerly an earnest advocate of electricity in the earlier stages of ectopic gestation, and in one case in which the diagnosis of extra-uterine pregnancy had been made, the faradaic current was repeatedly used without having any apparent influence upon the condition of the mass. Fearing to trust longer to such measures an operation was done, when it was found that the sac had ruptured, evidently before the electricity had been applied at all, and that we had an encysted mass in the pelvis, filled up with clot and debris of the embryonic development. In this patient the ovaries and tubes were removed, the abdominal cavity freed from its clots, thoroughly irrigated, and drainage practiced, with the subsequent recovery of the patient.

More careful study and experience in the progress and development of ectopic pregnancy, seems to us to indicate more clearly the importance of early resort to abdominal operation or radical procedure for its relief. Abdominal section is absolutely indicated in every case in which indications of rupture and hæmorrhage are present. In such cases time is of the greatest value. A collapsed and enfeebled condition of the patient may tempt the operator to endeavor first to overcome the effects of shock before subjecting her to operation, but what would be thought of the surgeon, who, when called to see a patient, suffering from rupture of a vessel of large size, which was pouring out the life-current, should neglect to resort to instant measures for its arrest? Incision and ligation of the bleeding-

vessel is just as absolutely indicated when hæmorrhage is taking place internally as if occurring externally.

May 13, 1890, I was called to see a patient 40 years of age, mother of twelve children, who had had a miscarriage eight months before. She had menstruated some five weeks before. The night before I saw her she went out to an entertainment, and was taken with violent pain in the side and faintness. She fainted several times during the night. When seen she was bloodless, pulse feeble, and unable to raise her head from the bed. The abdomen was large, pendulous, and gave negative symptoms upon vaginal and abdominal palpation. Believing that she was suffering from internal hæmorrhage, an incision was made. Two quarts of liquid and clotted blood were found in the cavity. In the left tube, rupture of a cyst the size of a cherry had taken place, and from it the hæmorrhage resulted. The tube was removed, irrigation and drainage used. The patient had an uninterrupted convalescence.

The ligation of the vessels, the emptying out of the abdomen, of the accumulated blood, the irrigation of its cavity with hot water, the stimulation of the flagging nerve centres with hypodermic injections of strychnine and the application of external heat, would be the measures which would give the most certain promise of relief to the suffering patient. When rupture has not yet occurred and the symptoms indicate the presence of an ectopic gestation, our treatment will depend somewhat upon the stage at which it comes under observation. If before the fifth month a section should be made as early as possible, and the foetal sac with its contents removed. This should be done for the reason that we have developing a foetus in such a position as to give rise to the greatest danger to the mother with the least reasonable probability of its safe continuance to viability.

After the fifth month the pregnancy may be permitted to continue until near the completion of a normal pregnancy, with the hope that a living foetus may be delivered. In the operation for the removal of such a foetus great care must be exercised to prevent hæmorrhage. Where it can be done, the seat of the placenta should be encircled with ligatures before this organ is removed. The placenta may be removed by rapidly peeling it off from its base and arresting hæmorrhage by gauze packing.

In other cases where it has a broad base, and severe hæmorrhage is feared, it may be preferable to permit the placenta to remain and be subsequently thrown off. The sac in such cases should be sutured to the abdominal wall, so as to exclude the peritoneal cavity in the subsequent progress of the condition, and thorough drainage should be secured. If the foetus be dead it is

better to postpone operation for its removal until after six weeks or two months, when the circulation in the placenta will have become occluded and there is much less danger from hæmorrhage. Where the foetus has been dead for a length of time and has become encysted, it is preferable that the operation should be done while the patient still remains in a healthy condition, rather than to wait until through some action or changes that have taken place in the sac and its contents, serious inflammatory conditions may be present which will greatly complicate the removal and the subsequent convalescence of the patient.

If following suppuration of the sac, sinuses have formed through which portions of the bones of the foetus have been discharged, the best results will usually be obtained by dilatation of the sinus and removal of the remaining portions of the fetus found within, irrigation of the sac and subsequent drainage.

A CERTAIN CLASS OF OBSTETRIC CASES IN WHICH THE USE OF FORCEPS IS IMPERATIVELY DEMANDED.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, Washington, D. C., May 5, 1891.

BY AUGUSTUS P. CLARKE, A.M., M.D.,
OF CAMBRIDGE, MASS.

Among obstetricians there is a conviction deepening more and more by experience, that whenever a preference is to be made between the use of forceps and a resort to internal version, the forceps should be chosen. The danger will be much less not only to the child but also to the mother. The risk that the child be born asphyxiated, and often, the difficulty if not impossibility of establishing artificial respiration, when internal version is had recourse to, are admitted by all accoucheurs. Even when in that class of cases in which there is much deformity, or unusual narrowness of the pelvis, the forceps is safer than version. In offering this statement, in favor of the choice of forceps, it is not on the ground that greater skill is required in the management by version, but because statistical reports of the masters of almost every country show that great risks are incurred by the employment of this method. All are aware that the forceps, within a comparatively recent period, has been used much more frequently than formerly. The adoption of the practice has assured greater safety in parturition; the mother has escaped many dangers, the mortality has been greatly reduced, and suffering has been more or less diminished. The timely use of forceps has also resulted in great saving of foetal life. It is said as an objection, that the forceps

has often been used to terminate labor that was in all respects progressing favorably. Admitting that this may sometimes have happened, we are taught, nevertheless, the fact that the obstetrician, having known the advantages to be derived by the forceps, and guided, as we must presume, by an intuitive instinct in the conduct of the right doing, has sought only to minimize a suffering, which to the minds of those less appreciative, would be regarded only as the development of the normal physiological function. Influenced in conduct by such motives the question arises, in what class of cases is the use of forceps imperatively demanded? Formerly the chief indications for the use of the forceps were the undue resistance from the soft parts, the debilitated condition of the mother, and the occurrence of convulsions. The indications here enumerated fall far short of comprising the conditions in which the forceps is now required. Within a recent period great improvements in obstetric practice have been made. The skill exercised in the development of surgical instruments generally has given us important improvements in the construction of forceps; consequently many cases of protracted labor, which would have heretofore been left to other methods of procedure, can now be happily terminated by the timely use of forceps. When the head of the foetus has descended into the cavity of the pelvis, and the labor has become lingering from uterine inertia, the forceps may be used with the greatest advantage. In protracted labor when the foetal head has engaged the pelvic brim, or has only reached that introitus and become arrested in its descent, the forceps should be preferred to all other means for relief. The necessity for the application of the forceps in such cases implies the existence of a normal, or a nearly normal, proportion of the pelvic cavity. In the case of Mrs. B., aged 23 years, who was confined March 10, for the fourth time the foetal head engaged in the pelvic brim, but could make no further descent. The pelvis, however, was well formed; the antero-posterior diameter was three and one-half inches, and the transverse nearly four inches. The position was occipito-anterior.

Regular recurring pains continued until some time after the cervix had fully dilated, and the membranes had ruptured, and the head had engaged the pelvic brim. After this, by some cause, apparently from the breadth of the shoulders and the size of the head, the case did not progress. Ether then being administered and the long forceps applied, labor was brought to an easy and speedy termination. The child was strong and did well. The mother suffered from no serious inconvenience. In her third confinement I was called in attendance. A similar condition of things obtained, except that the os, or rather the cervix, was slower in under-

going dilatation. Ether was given and the long forceps was used, without any mishap. In her second confinement I was also in attendance. The patient was much longer in labor; the position of the head was unfortunately occipito-posterior, and the head did not readily engage, but rested on the pelvic brim. The long forceps was called into requisition and delivery was successful. During her first confinement I was not in attendance. From the history of the case it appears that the patient was some twenty hours in labor. The forceps had to be used. The child was born alive; the head, however, I was informed, was much disfigured.

In a case to which I was called March 15, the head entered the pelvic cavity, but failing to make further perceptible advance, forceps was used. The position was occipito-posterior; delivery was easily accomplished. Both mother and child did well.

In another case to which I was recently called, the liquor amnii had escaped early, and the labor was making but little progress. The os and cervix were only partially relaxed. The pains were unusually severe, and at times almost tetanic. Morphia used hypodermically, and the inhalation of ether served in some measure to overcome the rigidity of the uterine cervix, and to enable me to apply long forceps to the head which was resting on the pelvic brim. In a case to which I was called in consultation the patient had been in labor some eight hours; the membranes had ruptured, and the pains were severe and exhausting, but failed to effect propulsion of the head. Chloral and subsequently ether were administered. This overcame the uterine spasms, and also served to relax and to dilate the cervix. Owing to the rigid and irritable conditions of the uterus generally, a resort to version was deemed unsafe, both to the mother and to the child. Forceps of somewhat unusual length was finally chosen, and delivery was safely accomplished. In reviewing the obstetric practice which I have had for the past twenty-four years, I find that in the cases in which the head became arrested at or above the brim of the pelvis, the results of each of the various methods adopted for relief clearly show that the long forceps is to be preferred. In almost every case in which the head of the child was at the brim, or had rested upon it, if forceps sufficiently long was employed, delivery was accomplished without serious injury. In cases in which the head had not reached the brim, if the cervix was relaxed, and supra-pubic, and abdominal pressure was rightly exercised, forceps could be applied, and delivery safely effected. In giving the results of my experience I make no reference to cases in which the head was above the brim, when there was evidence at the same time that the child was not alive; nor do I intend to consider the class of cases in which

a preternatural presentation occurs. In every such case the medical attendant can be guided only by the history of the patient, his own experience, and the indications before him. In regard to the great resistance offered by the soft parts as an indication for the choice of forceps, other methods of procedure may be resorted to with the most beneficial effect. Ether, and in cases of suspected renal complications, chloroform, chloral, opium, or morphia, hypodermically used, and nitrate of amyl will often assist in overcoming the vulval resistance. The administration of any one of the above may be supplemented by ergotine or by a milder oxytocic. The recent advances made by the development of the practice of gynecology unmistakably show, that the great resistance which is sometimes offered by the soft parts to the descent of the foetal head, especially when such resistance occurs in the vulva, should not be overcome by the application of forceps. By the employment of force, undue distention, and laceration of the vulva and of the vaginal introitus, as well as the lower segment of the uterus, the tissue and vessels of the bladder, and also of the perineal structures, are liable to take place. In cases of posterior occipital presentation we have a different element opposing the descent of the head. After the head has entered the pelvis the force of the uterine pains becomes misdirected. In this class of cases it is seldom that the soft parts offer any considerable resistance. The employment of the forceps, as has been said, merely regulates the propelling force, and soon without producing any untoward results the child will be in the hands of the nurse, and every danger which can reasonably be apprehended is found to have been averted. In regard to that class of cases of protracted labor in which the head has descended to the pelvic brim, experience shows, if I mistake not, that the forceps is imperatively demanded. In a case of protracted labor in which the head has not reached the brim, and the child is still alive, the results of my experience are largely in favor of the forceps. For every such case the forceps selected should be of the required length, and of a curve adapted to the peculiar features of the pelvis. The following case, to which I was called in consultation, illustrates the advantages of forceps in high operations: Mrs. H., aged 35 years, had been in labor twenty-seven hours. This was her first labor. Her physician had been in constant attendance. When I arrived I found that the membranes had been ruptured and that the os and cervix had fully dilated. The head was considerably above the pelvic brim. After the patient had been profoundly etherized long forceps was applied, but as soon as traction was made the blades slipped because they had not been curved sufficiently to allow their convex edges to sweep the hollow of the sacrum.

Forceps with a sharper curve was more easily applied, and the patient was quickly delivered of a living child whose weight exceeded nine pounds. The patient recovered without serious, constitutional, or local disturbances. Occasionally I have been called in consultation to cases in which I was expected to apply forceps before the cervix had fully dilated. In all such cases I advise waiting and endeavoring to effect by some of the different means proper dilatation of the lower uterine zone. In cases of puerperal eclampsia in which it is deemed necessary to hasten labor, digital and manual dilatation of the cervix should first be accomplished. Then, if the head presents, whether at the brim of the pelvis or above it, the forceps should be used. In breech or footling presentations, after the head has descended into the pelvis, the forceps is often of the greatest benefit in expediting labor, and thus preventing asphyxia of the child. In deciding in any case as to the necessity for the use of the forceps careful consideration has to be exercised. In reviewing discussions on the subject we have noticed that the advantages and safety of the forceps has been variously estimated. In the practice of some, the forceps has been used as often as once in every four to six cases. The necessity for such frequent use may not seem unlikely to occur in the practice of those who are connected with lying-in hospitals, or in the practice of those who are often called in consultation. This frequent employment of the forceps merely for shortening the time of labor betrays lack of appreciation of the real advantages to be derived by instrumental interference, and also want of conception of the dangers, either immediately or remotely, that may follow in any case in which forceps has been brought into requisition.

A REPORT OF TEN SELECTED CASES OF LAPAROTOMY, WITH REMARKS.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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The following brief report of laparotomies is made in the hope that its variety may not be wholly devoid of interest:

Case 1.—Mrs. D., æt. 38, presented herself at my office in the early part of April of last year, suffering considerable pain and inconvenience from a rapidly growing tumor in the abdomen, situated immediately to the right of the umbilicus. The growth was somewhat movable, and the size of a foetal head.

She presented an anxious expression, suffered from insomnia, and was rapidly losing flesh. A short time previous to this interview, a council

of several gentlemen had decided that her trouble was floating kidney, and had advised, and she had submitted to, tight bandaging with compresses, to keep the supposed floating kidney in place; this was worn for several days, until she rebelled on account of the pain which it occasioned.

As at that time there was no suspicion of anything of a malignant nature, and as I was on the eve of my departure for a month's absence, and she evidently needed "toning up," I left her in the care of my assistant, but advised removal of the growth by abdominal section, immediately on my return home—which I may mention was hastened several days on account of news of her rapidly increasing unsatisfactory condition.

May 29, she was anæsthetized, and the abdomen opened in the linea alba, the incision extending from the umbilicus, to near the symphysis pubis. Upon passing my hand within the abdomen, over and around the tumor, I found extensive attachments. The ventral wound was extended three inches upward, and to the left of the umbilicus, and the growth turned out. It was attached to the mesentery, the intestines and the lower lobe of the liver by an intricate mass of adhesions, and was carcinomatous. Of course there was but one thing to be done, and that was to return it to the abdominal cavity and close the wound.

She rallied nicely from the operation, and much to my surprise the abdominal wound healed throughout nearly its whole extent by first intention, only a sinus remaining at the lower angle of the wound to give us trouble. I scarcely need say that she has since died.

Case 2.—On June 13, just fourteen days after my very unpleasant experience with the case above referred to, Mrs. A. E. A., æt. 32, who had long been a sufferer from ovarian irritation, with all its attendant ills, was placed on the table and both ovaries and the Fallopian tube of one side were removed through a two and one-quarter inch incision in the linea alba. Each ovary was not only inflamed and enlarged, but one furnished more than a tablespoonful of pus. The reaction was prompt, and the wound healed by first intention, all stitches being out by the seventh day. The cure in this case is complete; the lady goes into society, does shopping, and now superintends her household affairs, and is again the bright star in the beautiful and refined home over which she presides.

Case 3.—Mrs. R. C., æt. 29, rather fleshy, though always pale, had been a sufferer from ovarian irritation since she was 14 years of age. Her spine had been many times blistered, cupped and painted with iodine, croton oil, tartar emetic, etc. Her womb had been dilated—though for what real reason heaven only knows. She had been sent to Colorado, to the Hot Springs of

Arkansas, Eureka, and many others, but to no advantage.

She was anæsthetized with bichloride of methylene used in a Junker's inhaler. An incision two and one-half inches in extent was made in the linea alba, and both ovaries and both Fallopian tubes were removed. She also rallied well, the ventral wound healing by first intention. She walked out, a block away to the corner grocery, on the sixteenth day; she is now in the enjoyment of excellent health, and so far with the sexual instinct the same as before operation. In both these cases of Battey-Tait operation there has been no return of menstrual flows.

Case 4.—Mrs. S. G., æt. 44; an anæmic, bed-ridden sufferer, with an enormous sub-peritoneal fibroma. Bowels could not be moved even by powerful cathartics and rectal injections, oftener than once in twelve to sixteen days, when they would suddenly run off for two or three days. This condition was occasioned by mechanical pressure, which produced irritation and inflammation, and caused many adhesions. The growth was removed through an incision extending almost from the xyphoid cartilage to the symphysis pubis. While breaking up adhesions very gently with my finger, I had the misfortune to split the softened gut to the extent of two and a half inches; fecal matter poured into the abdominal cavity, which was quickly cleansed by sponges squeezed out of a 1:2,000 mercuric bichloride solution. Placing my finger in the rent, the tissues were so softened that the tear extended at least another inch in extent, making three and a half in length. It was closed up with silk, using the Lembert suture.

When the operation was completed she was almost moribund. About a dozen and a half hypodermic syringefuls of brandy were thrown under the skin in the arms and legs, she was put to bed and her body and limbs surrounded by hot water. Reaction was obtained slowly but perfectly, and recovery was uneventful. A stitch-hole sinus gave the only real trouble, and did not close for over four weeks.

Case 5.—October 16, 1889, I received a letter by messenger from a medical gentleman, urging me, if possible, to meet him, together with two others, in consultation, immediately on the arrival of the train. He said, "my diagnosis is uterine tumor, probably fibrous. She is suffering intensely with tenesmus of the bladder and rectum; something must be done early, and I hope you will be able to come this evening."

I found the doctor's fears to be indeed well founded. A lady of culture and refinement surrounded by every evidence of luxury, but was in a semi-unconscious state, with a temperature of 103°, suffering excruciating agony, which the most heroic doses of morphia only relieved by being frequently repeated. A tumor to all ap-

pearances hard and solid, protruded at the front of the abdomen, yet was jammed down in the pelvis, and its lower segments could be distinctly felt in the retro-uterine space.

Matters were indeed desperate, and although abdominal section gave but a ray of hope, yet it was decided to give her this slender chance. It was done the next morning, and we found a suppurating tumor, broken down in its entirety, which sprang from the left ovary, and pus, pus, pus everywhere. The operation lasted fifty minutes; she rallied gradually, and with no nausea, but although the temperature came down almost to normal, she died of exhaustion, and previous septic infection, on the fifth day after the operation.

Case 6.—Mrs. E. D. H., æt. 37. Since the birth of her only child, now 14 years of age, has never been “just well.” About four years ago began to suffer much pain, and an unusual loss of blood at her menstrual periods. Matters went on from bad to worse, during which time she had gone the “grand rounds,” consulting “regulars,” irregulars and defectives. At the time of my first interview I found a woman nervous, anæmic and pale from loss of blood, spending one-half of her time in bed, and losing blood three weeks out of four; thus having only one week in the intermenstrual period in which to recuperate. Examination revealed the uterus enlarged to a size of that between the third and fourth month of pregnancy, the os quite low down, and the fundus and part of the body easily felt through the abdominal parietes. By bimanual palpation was easily made out its hard, nodular and irregular outline. The removal of the ovaries to bring about the menopause was promptly advised, and as promptly declined. Coupled, however, with the request that something be done other than a surgical operation. Much against my own judgment I consented to retain the management of her case, and during a period of four months following subjected her to many hypodermatics of ergotine introduced in the linea alba, with the advantage of producing two painful abscesses and no control of the hæmorrhage. I now informed her that temporizing, at least at my hands, was at an end, and that she must be governed wholly and absolutely by my advice, or I should retire from the further management of her case. A family council was held, which resulted in their acquiescence, and a laparotomy was performed the next day. Bichloride of methylene in a Junker's inhaler being the anæsthetic used. An incision five inches in length was made in the linea alba; introducing the hand into the abdomen, it was easy to make out six or seven hard multiple myomatous tumors, varying in size from that of an almond to that of a goose egg, imbedded in and protruding from the walls of the uterus; the ovaries were found and removed

without difficulty, and the ventral wound closed with silk-worm gut sutures. Recovery prompt and uneventful. Some show of blood at two or three menstrual periods following, but no hæmorrhage, cure complete. She is not a believer in hypodermic medication.

Case 7.—Mrs. R. O., æt. 25, was first a mother at the age of 19. Had been an invalid since the birth of her youngest child, now 4 years of age. Suffered from albuminuria; had “sinking spells” together with an enormous distention of the abdomen, for the relief of which she sought, not the Pool of Siloam, but the healing and rejuvenating waters of Lebanon, Mo., where she came under the professional care of my friend, Dr. J. M. Billings, of that place, who, recognizing her real condition, referred her to me for operation.

The doctor arrived the next day, but I suggested to him that on account of her unsatisfactory condition it might be well to postpone the operation for a few days (her temperature being two degrees above normal), when he replied, “you may as well proceed with the operation, for you will never get her in better condition; only a short time ago her husband was sent for to come to Lebanon to see her die.”

Accordingly the operation was performed the day after his arrival.

Our diagnosis was unilocular cyst of the left ovary. Circumference of the abdomen over the umbilicus was 39 inches. Time of operation, one hour; weight of tumor, 36 pounds; it was multilocular, instead of unilocular as we had supposed.

There were extensive but not firm adhesions, which were abdominal rather than pelvic, the most troublesome being in the region of the liver. Pedicle was transfixed, ligated and pocketed.

The ventral wound was closed with sixteen silk-worm gut sutures. External dressings, antiseptic gauze, compresses and the time-honored flannel bandage.

Much to my surprise, I found her at 7 P.M., on the evening of the day of the operation, with a temperature of 98 degrees, and no vomiting.

The temperature did not go above 100 degrees until after the tenth day.

Ten sutures were removed on the seventh day, and the remaining six on the eighth, the wound having healed throughout by first intention.

On the evening of the tenth day the temperature suddenly went up to 102.5 degrees, and by the twenty-second, in spite of antipyretics, had reached 103 degrees, after which it steadily and rapidly declined to 98 degrees with the space of five days.

I accounted for the above condition as follows: At the time of the sudden rise of temperature the skin assumed a yellow tinge, and within twenty-four hours had presented the dark, yellow hue of a typical case of jaundice, continuing until the twenty-second in spite of all the medication which had been used.

I now became convinced that the trouble was occasioned by occlusion, more or less complete, of the ductus communis choledocus, on account of contraction of the raw surfaces which had been produced in breaking up adhesions in its vicinity, and that my patient would die if not relieved. So I resorted to no very gentle massage, over this particular region, and with the most happy effect, for within twenty-four hours the skin and conjunctiva had sensibly cleared up, and rapidly continued to do so until they had assumed their natural hue.

The temperature within the first twenty-four hours had fallen nearly 3 degrees, and as I before stated, was normal by the end of the fifth. After which she went on to a rapid and satisfactory recovery.

Case 8.—Mrs. F. C., æt. 45. When in good health a large, fleshy woman. Mother of several children. About four years ago noticed some change in her menstruation, it being increased both in duration and quantity. At first she gave it little thought, as she suppose she was reaching the climacteric.

Later on she noticed a small lump in the right ovarian region, together with an increase in the size of her abdomen. Yet, as she expressed it, she thought she must be again pregnant "in spite of herself." The abdomen continuing to enlarge and the period of pregnancy having passed, she realized the possibility of abdominal tumor of some kind.

Her general health now began to fail. She lost flesh, suffered from indigestion, and had many profuse uterine hæmorrhages, together with a rapidly increasing abdomen; and at the time I saw her, the *facies ovariana* was well marked.

At the preliminary examination of this case, I was at first a little undecided, on account of the uterine hæmorrhages and the nodular and somewhat irregular outline of the abdomen, whether it was an enormous subperitoneal fibroma, or a multilocular cyst. I finally, however, decided that it was a multilocular cyst, and had the satisfaction of confirming my diagnosis at the operation.

A tumor of 30 pounds weight was removed, which was partly solid, but having many compartments; the solid part furnishing a most beautiful specimen.

The pedicle, which contained two unusually large vessels, was transfixed, ligated and dropped back into the abdomen.

Wound closed by silk-worm gut sutures, and antiseptic dressings applied. Time of work fifty minutes. Some nausea, but no vomiting followed. Abdominal wound was inspected on the morning of sixth day; it having healed by first intention, without a drop of pus or a blush of inflammation. No rise of temperature at any time of over 2 degrees above normal.

Case 9.—On December 10th, 1890, Mrs. M. B., age 38, height five feet one inch, weight ninety pounds, was sent to me from a distance to have an unilateral laceration of the cervix restored.

She first menstruated at the age of twelve. Was married at 25. Is the mother of two children, the youngest being now seven years of age, from the birth of which she dates her ill health.

For the past five years has been absolutely unable to endure marital relations. Has suffered great pain and tenderness in right ovarian region, and, in a lesser degree, also in the left, together with weight and dragging in lower part of abdomen. Has suffered much from insomnia, palpitation of the heart, and is very melancholy. Has been often confined to her bed for weeks at a time, the longest being from January to June of last year, at which time, as she expressed herself, she was "past pain."

She suffered much from menstrual headaches, and was seldom free from the peculiar sense of heat and weight upon the vertex, so characteristic of uterine and ovarian irritation. At the time of my first interview, I found a woman just upon the verge of insanity. One of the first things I did was to remove a horseshoe pessary from her vagina, which she had worn for many months. The little tear in the cervix amounted to next to nothing.

Some granular erosion existed on the os, and the uterus was inflamed and congested. With the right index finger in the vagina, and the left hand upon the abdomen, I could easily make out the soft, baggy and irregular rounded tumors, sausage-like, in the ovarian region, the right larger than the left, both being exquisitely tender, and although the examination was conducted with care and gentleness, yet she complained of nausea and faintness. She was, therefore, advised to submit to laparotomy for removal of both ovaries and Fallopian tubes.

After one week of rest and preparation, the operation was performed on December 17, 1890.

Bichloride of methylene in a Junker's inhaler being the anæsthetic which I always use in my abdominal operations, was of course the chosen one. Through a two and one-half inch incision in the linea alba, the left tube and ovary was easily removed. Not so, however, with the right, as it was prolapsed deeply into Douglass cul-de-sac, and was bound down by many and rather strong adhesions. After being brought out through the ventral wound, I found not only an enlarged tube, but also a beautiful specimen of hæmatoma of the ovary, in size about as large as a turkey's egg.

I wish here to call the attention of my professional brethren to the excellence and safety of Mr. Lawson Tait's Staffordshire knot in the ligation of the pedicle.

The ventral wound was closed with silkworm

gut sutures introduced from within outwards. The patient rallied nicely, and, as is usual in my experience with the anæsthetic used, with no nausea.

Her recovery was eventful, the temperature at no time going above 101 degrees. Sutures were all out by the seventh day, and she returned to her home in one month after the date of operation.

A gratifying feature in this case was the prompt amelioration of all her unpleasant nervous symptoms—within a week after operation the expression of her countenance was markedly changed. She became bright and cheerful, and proved herself to be a woman of far more intelligence than I at first supposed her to be. I shall watch the after-results of this case with much interest.

Case 10.—Mary A. J., single, æt. 38, height 5 feet, 5½ inches, weight before operation, 199½ pounds. American, of rather masculine appearance, large bones, coarse features, having hair on the upper lip and chin. I found her in the poor house near Trenton, Grundy County, Mo., on November 26, 1890, suffering with a colossal growth of the abdomen, a good idea of which may be obtained from the photograph which I took at the time of my first interview.

Measurements taken at that time were as follows: Circumference at largest part just below umbilicus, 50 inches. Circumference just below the mamma, 35 inches. From xyphoid cartilage to symphysis pubis, 32 inches, not including the pendant appendum, which is shown in the picture. From xyphoid cartilage to umbilicus, 13 inches; from right anterior superior spine of ilium, to umbilicus, 14 inches; left anterior superior spine of ilium, 13½ inches. Circumference of pendulous portion of growth at neck just below symphysis pubis, 27 inches. Circumference at its base, 30 inches. The surface was smooth, tense and slightly clastic, large tortuous veins passing in various directions.

Percussion imparted a slight wave that almost suggested fluid within a sac. The uterus was drawn up to the extent of twelve or fourteen inches. She walked with great difficulty and with a waddling gait, bending far backward, the better to keep "the center of gravity within the base," and thereby be better able to sustain the enormous weight of her abdomen. She was compelled to pass her urine while standing upon her feet.

Attempts had been made six and two years respectively, before my first examination, to tap her, and although a large trocar was thrust into the growth at several points, yet nothing came out but a few drops of blood.

Diagnosis.—Either multilocular ovarian cyst or oedematous myoma of the uterus.

At the beginning of her enlargement she was supposed to be *enciénte*, was spurned and cast off

by her family and friends, and after suffering many privations and hardships finally brought up in the poor-house, where I first saw her, at the solicitation of two prominent ladies from whom I had, during the past summer, removed large ovarian tumors.



Their attention being called to this poor unfortunate, and being actuated by that bond of sympathy "which makes all the world akin," they provided the means for her care and transportation to St. Louis, for operation, provided I thought best to do so. Although she was at the time failing rapidly, I saw that she had not the slightest ray of hope from any thing but an operation, and believing that the justifiableness of any operative procedure consists in its necessity, I advised her to accept the only chance, though a slender one, for her life, which she promptly did.

A few days later she was brought to this city by Dr. H. H. Wilson, of Trenton, Mo., and one of the ladies above referred to, and placed in the hospital.

During the few days of rest and preparation before operation, I requested Mr. Thompson to have her weighed. The following was received from him:

ST. LOUIS, December, 6th, 1890.

Dr. McIntyre:—Your case, Miss Mary E. Johnson, in room No. 10, was weighed by me at 9:50 A.M., and tilts the beam at 199½ lbs., good weight. Respectfully,
F. P. THOMPSON.

On the morning of December 7th, 1890, the operation was performed with the assistance of Drs. Broome, Marks and Nichols of this city, and Dr. H. H. Wilson, of Trenton, Mo.; Drs. Gib. W. Carson, R. A. Quarles, P. S. O'Reilly, Moore and medical students Charles Lewis and F. P. Thompson of this city being present.

Bichloride of methylene in a Junker's inhaler, was the anæsthetic chosen. Anæsthesia was easily and promptly induced, and was maintained during the one hour and five minutes that the operation lasted, five and one-half drachms being used.

An incision fourteen inches in length was first made in the linea alba, below the umbilicus, and afterwards extended up to near the xyphoid cartilage. The hæmorrhage made by the incision in the abdomen wall was very free, and the enormously distended vessels required the application of a large number of pressure forceps. Adhesions were found almost everywhere, the most difficult to manage being those attached to the liver and diaphragm. The broad ligaments and Fallopian tubes were ligated on either side, the tumor turned out, the thick heavy pedicle transfixed and ligated, and the tumor cut away.

It is a matter worthy of remark, that at the time of detachment of adhesions to the diaphragm the patient sank rapidly, and as it was thought that she might die on the table, hypodermics of whisky were freely used before she rallied, and several minutes of time lost during the interval.

A stream of hot water was kept playing upon the wound during the whole time of operation.

The toilet of the peritoneum was necessarily hurried, and was greatly facilitated by pouring pitcher full after pitcher full of distilled water heated to a temperature of 110 degrees, into the abdomen. The ventral wound was closed with silkworm gut sutures, adhesive straps applied across the abdomen; compresses and the time-honored binder completed the dressing.

As she was being carried from the operating room, through the hall to her bedroom, the stretcher was allowed to rest upon the platform scales for a few moments, and we found that we had 106 pounds of woman left, and as her weight before operation in the same clothing was 192½ pounds, we found that the weight of the tumor was 93½ pounds. Placed in bed she was surrounded by bottles filled with hot water, and free hypodermics of whisky used. Within a few hours she had rallied well and with no nausea.

This case was manifestly one for drainage, but on account of the vast expanse of lax abdominal tissue, I did not believe that red serum would gravitate into Douglass' space sufficiently to re-

move it through the Kieth tube. I therefore remarked to the gentlemen present that if at any time the temperature went up so as to require it, we would cut a few ventral sutures and flush out the abdominal cavity. By the morning of the second day, forty-eight hours after the operation, the temperature in spite of antipyretics went up to 103.5. She was taken into the operating room and the abdomen flushed with hot distilled water, and many blood-clots and much serum removed, with the result that within six hours the temperature had fallen to 101°. A drainage-tube being now introduced furnished but little serum afterwards. Temperature did not go above 102 degrees for the succeeding twenty-four hours. Within another forty-eight hours, symptoms of septicæmia became manifest, together with septicæmic vomiting, and she died at 4 A.M., December 12th, the fifth day after operation.

REMARKS.

The lesson which I learned, and the regret which I have in the after-management of this case, especially after witnessing the lowering of the temperature and the amelioration of unpleasant symptoms after the flushing of the abdomen with a large quantity of hot water, is that I did not resort to it again, or indeed as often as might seem necessary, for she became bright and cheerful, took liquid nourishment well, and flatus passed the bowels, and I began to have high hopes of her recovery.

The ordinary drainage-tube did comparatively little good, as the enormously distended abdominal walls favored collections of serum in pockets, it did not gravitate into Douglass' pouch; consequently the peritoneum with its wonderful absorbing powers, which at once constitute its safety and its danger, took up septic material with fatal results.

In looking over the literature of this subject I find no mention of any solid tumor of this size being removed.

Keith, late of Edinburgh, now of London, successfully removed an œdematous myoma, together with the uterus, which was of 42 pounds weight, on the 18th of April, 1881.

Mr. Lawson Tait, of Birmingham, England, reports in Vol. 1, of his recent work, "Diseases of Women and Abdominal Surgery," page 187, that the largest uterine myoma which he ever removed in his life was of 68 pounds weight, and that it grew after the menopause. So, I believe that this one of my own, 93½ pounds, is the largest yet reported.

In all laparotomies I carry out the strictest antiseptic precautions, although I abandoned the spray six years ago, and I now get better results without it than I did with it. All instruments are placed in a large shallow photographer's dish containing a 1 to 40 carbolic acid solution, be-

fore and at the time of operation. Plenty of the finest quality of sponges, cup and flat, are kept for this operation alone, and are used in no other, and I give their cleansing and preparation my own personal attention. Bleeding points are ligated with fine Japanese cable silk. The pedicle is always ligated and pocketed. The ventral wound I always close with silk-worm gut threaded upon two long veterinary needles, and pass the needles from within outward, always including the peritoneum. The idea of its use I received more than ten years ago from Geo. Granville Bantock, of London. It is very strong and smooth, and can easily be made aseptic; being somewhat stiff, it should be steeped for a few hours before being used in a solution of some kind, so that there may be no difficulty in tying it tightly. It is the ideal suture, not only in closing the ventral wound in laparotomies, but also in lacerations of the cervix and perineum.

For inducing anæsthesia, I use exclusively bichloride of methylene in a Junker's inhaler, and now with an experience in its use in over three hundred operations of various kinds, while I have not infrequently seen nausea, I have only seen vomiting five or six times.

When in doubt I always drain, and prefer Keith's glass tube to all others.

I use but little opium or morphia, for the reason that this drug, by locking up the secretions, limits the power of elimination, and thereby favors septicæmia. For over a year past in cases of laparotomy where pain and rise of temperature was present, I have used antikamnia in ten grain doses with the happiest effects.

After doing the Battey-Tait operation a large number of times, I wish here to add my testimony to that of others, that removal of the uterine appendages does not entail a loss of sexual feeling; excitability of the genital organs still remains, the voice is unaltered, and the womanly attributes are no less after the artificial than after the natural menopause.

614 Olive St.

THE TREATMENT OF OCCIPITO-POSTERIOR POSITIONS.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D.C., May, 1891.

BY A. WORCESTER, A.M., M.D.,
OF WALTHAM, MASS.

The discovery of an occipito-posterior position is always a most unwelcome discovery. Even if all other conditions are favorable, this is unfavorable, and at best means a longer labor and an increase of all the dangers of exhaustion; while, on the other hand, in such cases, more often than in cases of occipito-anterior position, operative assistance is demanded, and yet can be given only with more difficulty.

In view of this greater probability that operative assistance will eventually be necessary, and in view also of the greater safety, to both mother and child, if such assistance be given early, I maintain, contrary though it be to generally accepted teaching, that, instead of being less ready, we should be more ready to assist the delivery in cases of occipito-posterior, than in cases of occipito-anterior, position.

I cannot, however, accept as very practicable the plan of rotating the foetus from an anterior to a posterior position before labor begins. For, even if it is easy to do, it can be done only at the sacrifice of the mother's natural confidence that all is just as it should be with herself and unborn babe. Moreover, this rotation can be just as well performed after labor has begun, when the sufferer longs for every possible assistance.

In this paper I propose to consider the treatment only of such cases as are unlikely to progress favorably either if left to nature, or if assisted merely by flexing the head and favoring rotation manually. After briefly considering the six methods in common use, I hope to show that one of these methods, slightly modified, is pre-eminently advantageous.

1. Let us first consider podalic version. By this method delivery can be quickly effected. The only disadvantage is the danger of lacerating the parturient canal; or, if time sufficient for the stretching of the perineum be allowed, there is then the danger of suffocating the child. Probably in no other obstetric operation does the personal equation of the operator count for so much. And the skill which alone can insure safety to both mother and child can be gained only at the expense of many a perineum and many a foetus.

2. By manual rotation of the occiput to the front, the original disadvantage of a posterior position can be eliminated. Where this can be done without anæsthesia, and at exactly the proper time, no safer method of treatment need be sought. But, if done too early, the head will generally rotate back into its original position before it becomes engaged; while, on the other hand, if artificial rotation is not attempted before the uterus has firmly grasped the foetus, it becomes a very difficult task. Moreover, it is only in exceptional cases that manual rotation can be done without anæsthetizing the patient; and then there is an awkward interval before the uterine and abdominal muscles sufficiently recover from the anæsthesia to engage the head. During this interval the new position can be maintained only by holding with the hand. A more trying situation for both patient and accoucheur cannot be imagined.

Let us now consider the four methods of treating occipito-posterior positions by means of the forceps.

3. By applying the blades over the parietal

bones, the head can be delivered with the face under the pubic arch. This can be safely done where the head is fairly small in proportion to the size of the pelvis, and where the perineum is very lax. But inasmuch as it can be done only at considerable risk, and only by much stronger traction than would be necessary if the occiput were in anterior position, this method can be recommended only when previous manual rotation of the head is contraindicated. Practically, it is probable that in a large proportion of the cases where the head has been delivered by forceps with the face under the arch, the diagnosis of occipito-posterior position has been made post-partum.

4. With straight forceps, the head can be rotated while in the parturient canal.

5. By repeated applications of the forceps, as the head rotates during its assisted descent, the natural progress can be imitated. Not having employed either of these last two methods, I am not justified in criticising. The objections to each method are obvious, but there could certainly be no objection to practicing either upon the cadaver.

6. After manual rotation of the occiput from posterior to anterior position, the head can be delivered by means of the forceps, or can be drawn down into the pelvis in this acquired favorable position, and left for natural expulsion.

The only difficulties attending the employment of this method have been in conforming the traction to the axis of the parturient canal, and in maintaining the anterior position of the occiput while applying the forceps. The first difficulty, common to all high forceps operations, has been practically obviated by the use of axis traction instruments. And the second difficulty can be obviated *by applying the instruments under the guidance of the operator's hand inside the uterus.*

After the entire escape of the liquor amnii, and after the uterus has by its tonic contraction, or by its retraction, firmly grasped the foetus, or still worse, after the head is impacted in the pelvis, it is, of course, as impossible to rotate the occiput into anterior position as it is to do podalic version. The trouble in such cases, however, is due, not to the impracticability of the method here advocated, but to the mismanagement of letting pass the only time when the child's life might have been saved.

Until the child's life has been thus defaulted, it is certainly easy, with one hand in the uterus of the fully anæsthetized patient, for the operator to rotate the foetal head into anterior position. He may, of course, need the aid of his other hand, or of his assistant's hands, on the outside. If now the forceps can be properly applied, the disadvantage of the original position will be overcome.

In the use of forceps at the brim of the pelvis, unless the operator is exactly sure of the position

of the foetal head, of its complete flexion, and also of the location of the blades' impingement, it is a matter of luck if the delivery proves to be easy and safe. If there is difficulty in locking the instruments, or if, on traction, the handles separate, the operator of course will suspect that some mistake has been made in applying the blades. But the only way of being absolutely sure, and of rectifying any unfavorable condition, is by means of the whole hand inside the uterus. Now it is not practicable, after the forceps are applied, to introduce into the uterus the whole hand, but while the hand is inside the uterus, it is practicable, and safe, and easy to introduce and apply the forceps. The wrist and forearm of the operator, if rotated from his shoulder, allow each blade in turn to pass through the parturient canal alongside their sensitive flexor surfaces, thus beautifully guiding the blades into the uterus, where, in the palm of the operator's hand, each blade in turn can be applied to the elected area of the foetal head. Having then locked the handles, and having placed the head in the most favorable position as regards the pelvic diameter, the operator can then easily withdraw his hand alongside the shanks of the forceps.

If, now, axis traction appliances are attached, thus guarding against the dangers of traction in any tangent to the pelvic axis, the foetal head can be delivered, or, after having been drawn down into the pelvis, it can safely be left for natural expulsion. If by this method the child's life is not saved, the accoucheur may rest assured that the living child could not have been delivered *per vias naturales.*

In offering to the profession any new method, it is proper to give one's own experience therewith. I therefore add the reports of the four cases where I have employed the method advocated:

Case 1.—Mrs. B., primipara, 27 years old, had been in labor thirty-six hours when I was called by Dr. E. R. Cutler to help in her delivery, December 15, 1890. There was no engagement of the foetal head. Under the mistaken diagnosis of an occipito-pubic position, the forceps was applied, and we each in turn vainly tried to effect delivery. After removing the forceps, with the whole hand in the uterus, the position was found to be occipito-posterior. Without removal of the hand, after rotating the occiput to the front, the instruments were reapplied, the hand was withdrawn, and then the child was easily delivered in good condition. The posterior vaginal wall suffered a slight oblique laceration.

Case 2.—Mrs. R., primipara, 25 years old, had been in labor twenty-one hours when I was called in consultation by Dr. A. Greenwood, December 27, 1890. Her condition necessitated artificial delivery. Her pelvis was contracted; the distance between the crests of the ilia being $10\frac{1}{2}$

inches, between the anterior superior spines of the ilia $7\frac{1}{2}$ inches, between the trochanters $12\frac{1}{2}$, and the external conjugate diameter being $6\frac{1}{4}$ inches. Under full anæsthesia the dilatation of the os uteri was completed normally. The occiput was rotated from left-posterior to left-anterior position, and, without removal of the hand, the forceps was applied. Traction-rods were attached. After tremendous pulling, a male infant weighing 8 lbs. was delivered. His right eyelid was torn. With some difficulty he was resuscitated, but he died the next day, evidently from injuries received during delivery. The mother's vagina suffered several slight lacerations.

Case 3.—Mrs. H., quartipara, 29 years old, after several hours of ineffectual second-stage labor, was etherized, Dr. H. A. Wood assisting, March 24, 1891. The position of the foetus was occipito-right-posterior. With the whole hand inside the uterus, the position was changed to occipito-anterior, and forceps applied before withdrawing the hand. A male child weighing 10 lbs. was then easily delivered. The mother's vagina and perineum suffered no damage.

Case 4.—Mrs. C., primipara, 22 years old, had been in labor twenty-four hours, and the pains had almost ceased, when, with Dr. H. A. Wood's assistance, she was etherized. The foetal head had descended to the inferior straits in left-posterior position. In spite of good flexion, there had been no sign of natural rotation. The head was thereupon pushed back above the pelvic brim, rotated to anterior position, and forceps applied to it before removing my hand. Extraction was then easy. The female child weighed 7 lbs. and was uninjured, although one blade of the forceps was applied to the right eyebrow. The mother was also uninjured.

THE MANAGEMENT OF THE OMENTUM IN ABDOMINAL OPERATIONS.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY ANDREW F. CURRIER, M.D.,
OF NEW YORK CITY.

It is hoped that it will not be considered impertinent to offer a few suggestions upon this subject, apparently so simple, before a body composed so largely of abdominal surgeons, or surgeons who are familiar with abdominal operations, as is this section. The fact has been impressed upon my mind not only by my own experience, but by observation of the work of others, and a search of a considerable portion of the literature of abdominal surgery, that the subject in question has not received the attention which it deserves, and that it is by no means a matter of insignificance. This statement will be the more readily accepted if one remembers that

the essential portion of the omentum (the greater omentum alone is referred to in this paper) consists of peritoneum, and that its function, by virtue of the abundance of fat which forms one of its constituent elements, is of importance, inasmuch as it protects to a greater or less extent, the viscera which lie under it from sudden changes of temperature. Such a covering is therefore of great value in those localities in which climatic changes are not only sudden but severe, and in which one requires all the resources of art as well as nature to preserve the physical equilibrium.

It is therefore desirable in all cases in which the abdominal cavity is exposed that one observe the following propositions with reference to the omentum:

1. It should be preserved as nearly intact as the conditions of each individual case will allow.
2. Great care should be exercised to avoid wounding it in making the abdominal incision, or bruising or lacerating it at subsequent stages of an operation.
3. Badly injured portions should be resected with all due precautions, also such portions as cannot be so replaced as to occupy their original position and perform their normal function.
4. Before closing the abdominal wound it should be carefully and evenly replaced as the natural covering of the intestine.

In the large class of cases in which the lesions demanding surgical interference are located entirely, or to a great extent, in the pelvis, the omentum is very frequently a source of no particular trouble during an operation. If the incision is a short one with its lower limit near the symphysis pubis, and the omentum is not voluminous or adherent it may not be seen at all, and we are conscious of its presence only as it becomes entangled about the fingers when they are passed downward into the pelvis. The operation may be completed and the incision closed without a thought or an intimation of the presence of an omentum.

If an abdominal sponge is used to absorb the leakage from divided vessels and protect the intestines it must not be forgotten that as the sponge presses the latter upward it presses the omentum upward also, and when the sponge is withdrawn the omentum may still remain displaced, or gathered into a lump, or otherwise abnormally disposed so that it can no longer perform its proper function. In all the secondary abdominal sections which I have seen, including one of my own, I have never seen the omentum in its normal position. In my case neglect to properly replace this structure furnished opportunity for adhesion of the intestine to the parietal peritoneum, and so near was it to the incision that it barely escaped injury from the knife. In those cases in which the omentum is normal in

appearance but adherent to the parietal or visceral peritoneum the necessity for careful management must be self-evident. If it has been roughly handled peritonitis with new adhesions will almost certainly result. It must therefore be so evenly and so carefully disposed that if new adhesions are formed they will cause the least possible disturbance to the functional activity of the viscera to which they are attached.

Another class of cases includes those in which the omentum is atrophied or defective.

If the abdominal cavity is encroached upon by a large tumor, whether cystic or solid, the integrity of the omentum and its functional usefulness are generally destroyed. With such growths inflammatory processes are of frequent occurrence and may result in the most intimate adhesive union of the omentum with the peritoneal covering of the tumor. Should the new growth attain a large size and the omentum be imprisoned between it and the abdominal wall, the resulting pressure would cause absorption and disappearance of more or less of the fatty tissue in the omental structure, though the adhesive union of the peritoneal surfaces might continue. Of course it may happen that the omentum will be pushed upward by the advancing tumor, and that disturbances from pressure or inflammation will not be of such a character as to impair its structure. If atrophy have resulted from this or any other cause—by atrophy being meant the condition in which the quantity of omental fat is very small, it is not an indication that the omentum will require less careful treatment; on the contrary it must be handled with the greatest delicacy, and spread over the intestine with great nicety before the abdominal wound is closed, for the frailty of its structure endangers its integrity, and a small rent which might be overlooked might furnish entrance for a loop of intestine with disastrous strangulation as a consequence.

In the removal of large tumors with adherent omentum, conservatism and safety alike demand the free excision of all strips and fragments of the destroyed and useless structure. Too often has it been the method to tear away adherent portions from the tumor, tie their bleeding points, and then drop them, careless as to their arrangement, and forgetful of the fact that attachment to the intestinal may result in such a way as to favor intestine obstruction. A far better plan seems to me to leave no long ends floating about among the intestines, but to cut them off as high up as possible, even if it be necessary to approach the neighborhood of the stomach, then having obtained a straight or nearly straight lower border, to tie all bleeding points and sear the entire edge with the cautery at a low temperature.

Another class of cases, which, however, is a small one, includes those in which the omentum is hypertrophied. Such cases may be very trouble-

some. Not only is the deposit of fat of great thickness, but the structure may extend, like a long apron, deeply into the pelvis. To replace such a structure properly is a very difficult matter unless the abdominal incision has been a very long one, and even then it may not be entirely successful. Such a case recently occurred in my practice. The patient was a young widow, a masseuse by occupation, who was recovering from peritonitis and metritis following a curettement of the uterus, when I was called to see her in consultation. In addition to these inflammatory troubles there was a distinct tumor on either side of the uterus, within the pelvis. The patient was hysterical and a morphine eater, but an abdominal operation did not promise to be extra-formidable or extra-hazardous. The adhesions in the pelvis were readily broken up, an ovarian tumor as large as a hen's egg, with adherent and dilated tube, was removed from the left side, and equally degenerated but not quite so large appendages from the right side. The omentum dipped deeply into the pelvis and particular pains were taken to tuck it carefully and smoothly down. The effort was unsuccessful, for the patient died on the sixth day from septic general peritonitis (though there were also two perforations on the anterior aspect of the descending colon), and the inferior portion of the omentum on the right side was compressed into a mass as large as a child's fist, which was necrotic, evidently from interference with its circulation. I do not know that this was the primary or principal factor in producing the fatal result, but it was a factor and therefore carries a lesson and a warning with it. It would have been better in this case, and the rule would apply in all similar cases, to excise the lowest fourth of the omentum throughout its entire width. The remainder would have furnished ample covering for the intestines, and the bad results from pressure might have been obviated. The case which has been narrated is also illustrative of an accident to which the omentum is susceptible when hypertrophied or when adherent to the parietal peritoneum. In the case in question the omentum was very thick and in contact with but not adherent to the parietal peritoneum. In making the incision the tissues below the recti muscles were cut layer by layer, being made tense by the traction of hæmostatic forceps secured to either side of the wound, and then divided. Such a plan usually enables one to avoid cutting either omentum or intestine, for as soon as the peritoneal cavity is reached the tension of the forceps on either side of the wound draws its edges apart and reveals the space. It failed to do so in this instance and the omentum was incised on the supposition that the præ-peritoneal fat was being cut. Of course the mistake was soon discovered and with it the fact that the omentum was hyper-

trophied not only as to thickness but also as to length. I know of no infallible rule for preventing such accidents. It has never happened to me before and I can conceive of its happening to even the most careful and expert operators.

Wounds of the omentum may become sources of danger from sepsis, peritonitis, or hæmorrhage. In cases in which the omentum has been greatly torn or bruised sepsis and peritonitis are probably more frequent than is generally supposed. Certainly a loosely constructed, freely absorbing, easily degenerating tissue like this offers favorable conditions for serious inflammatory and septic trouble when once an injury has been received. The subject is one which invites pathological investigation in unexplored territory. Hæmorrhage from the omentum may be troublesome, serious or fatal. It is more likely to be venous than arterial, an oozing which may show little tendency to cease. A case of hæmorrhage of this character is reported as recently as May 18, of this year, in the *New York Medical Journal*, and in the practice of so eminent and careful a surgeon as Prof. William T. Bull. Fortunately in this case the bleeding was relieved by means of an iodoform gauze tampon within the abdomen, but such treatment would be ineffective and hazardous in many cases and might do serious damage by pressure upon other structures. Hæmorrhage from the omentum can usually be controlled by ligating the layer vessels, whether veins or arteries, with fine silk and touching all oozing points with the cautery. The latter is more effective than hot water irrigation, especially if trouble is anticipated from many oozing points.

Rents and incisions in the omentum have already been referred to, and the peculiar dangers to which they give rise. Hence they must not be neglected nor slighted whether small or large. They should be carefully and accurately closed with a continuous suture of fine Chinese silk or reliable catgut. It should not be forgotten by the abdominal surgeon that the object of his art is not merely to relieve the present suffering of a patient and remove an existing lesion, but to avoid the induction of other lesions which might be more intolerable than the original one. Unfortunately, such an ideal result is not always possible even to the most skillful or the most cautious, and this fact warrants constant vigilance and unwearying discussion of the subject in all its bearings and possibilities.

159 E. 37th St.

THE REMOTE EFFECTS OF FŒTAL BRAIN INJURY IN LABOR; OR, WHY WE ARE RIGHT- HANDED.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY F. W. GOODALL, M.D.,
OF BENNINGTON, VT.

We are right-handed because of injury of the motor centres of the right side of the foetal brain in labor. The manner of receiving this injury, and something of its nature, constitute the subject of this paper.

Some may take exceptions to my premises, and assert that the causes which determine the position of the foetus "at term," are the primary causes of right-handedness. This I decline to discuss. Much might be said concerning the bones, diameters, planes and outlet of the female pelvis, in introducing my subject. All these points I pass over, and pause only to say that the contour of the parts, or the natural structure and relations of the various bones and organs pertaining to the female pelvis, in connection with the physical character of the foetus, determines in a mechanical way how it shall present at delivery, and the presentation determines what motor centres, if any, shall be injured; and for the purposes of this paper, I embrace all head presentations under four varieties, which will be briefly defined in passing. I deal only with the first and fourth varieties, as it is only in these presentations that the right side of the head takes the brunt of labor. Largely in consequence of the rectum occupying the notch in the left side of the sacrum, the foetal head, which is naturally the presenting part, presents, in the great majority of cases, with its long axis in the right oblique diameter, the occiput being directed towards the left acetabulum, and the forehead towards the right sacro-iliac symphysis. From the relative position of the uterus, the pelvic canal, its floor and outlet, taken in connection with this position of the foetal head, the most advanced point of the head in the progress of delivery is usually somewhere to the right of a line drawn from the nasion (root of the nose) to the inion (base of the external occipital protuberance), and between the anterior and posterior fontanelles, a very important field of motor centres. In this position of the head, which is called in obstetric language the "first position," its long diameter is nearly parallel with the superior plane of the pelvis at the commencement of labor, but there is a very decided lateral obliquity of the head, in consequence of the inclination forwards and downwards of the fundus uteri, the right side of the cranium being considerably lower than the left, and the most depending part of the cranium is the right parietal eminence.

IN HONOR OF VIRCHOW.—The freedom of the City of Berlin is to be extended to the eminent pathologist and medical patriarch on his seventieth birthday; and upon the same occasion his portrait will be hung in the Council Chamber.

The earlier the examination is made the more decided the above condition will be found; as the head passes the brim of the pelvis and descends into the pelvic cavity, it rotates, and soon its long diameter has become nearly antero-posterior, the occiput being directed forward, and the most dependent point has now become the upper and posterior part of the right parietal bone, and this portion of the head is the part that first escapes from the vulva. The second obstetric position we pass over without notice, as in this position the occiput is towards the right acetabulum, the forehead towards the left sacro-iliac symphysis, and the left parietal eminence is the most advanced point of the head. The third obstetric position, with the forehead opposite the left acetabulum, the vertex towards the right sacro-iliac symphysis, and the left parietal eminence the presenting or most dependent part of the head, we also pass over. In the fourth position, with the forehead directed towards the right acetabulum, and the occiput towards the left sacro-iliac symphysis, we again find the right parietal bone most prominent, but in this presentation it is its anterior and upper part that is first reached by the finger, and injuries received in this position involve the right motor centres, as is also the case in the first presentation.

The relative frequency with which these several presentations are met, vary somewhat as stated by different observers, but it is conceded by all that the first variety by far outnumbers all the others. I think it is perfectly fair to say that from 70 to 75 per cent., or more, of all head presentations, are of the first and fourth varieties; hence 70 per cent. and upwards of all children presenting naturally, are born with the right side of the head subjected to a greater degree of mechanical pressure and violence than is the left side, and it is to this violence or injury of the right side of the foetal head, that I wish to call your special attention.

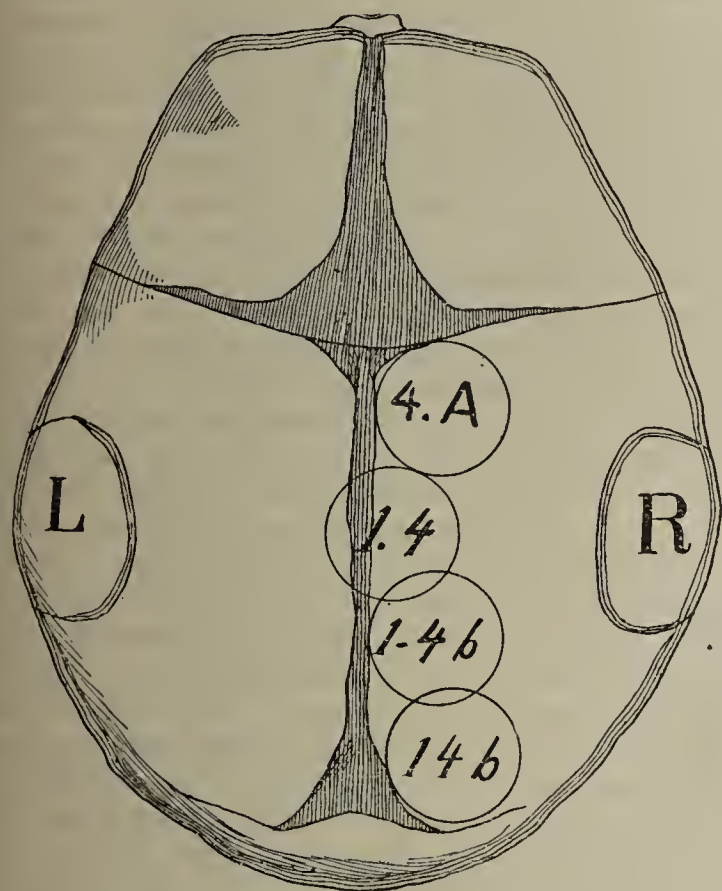
It is only necessary to mention the existence of the caput succedaneum, so often seen at birth, that you will at once recognize and concede that the foetal head has been subjected in some cases to a degree of pressure amounting to violence, varying in different cases, according to the expulsive power, and resistance offered by the parts through which it has passed. This scalp tumor is usually single, but in very protracted cases, especially if of marked severity, we may find two distinct tumors, or even a fairly well defined chain of several small ones, more or less blended in one mass of contusion.

All are not agreed as to the exact manner in which these tumors are produced. I was taught in my student days that they were due to pressure upon a rigid os, but personal observation of the phenomena of labor teaches me that the caput succedaneum is due to a lack of support of that

portion of the head which engages within the ring of the cervix, and later on is found in the vagina with nothing to support it but a species of void, during the pressure of the combined forces brought to bear upon every inch of the remaining superficies of the foetus. This small unsupported area represents, or is the point of impact, so to speak, of all the tremendous force hurled upon the foetus as a whole, at every repetition of the labor pains, and in consequence of the varying position of the head, due to rotation, we get a little change in the position of the so-called point of impact, and in protracted, tedious cases, different points of impact remain nearly stationary, long enough to give rise to an individual tumefaction for the varying positions, thus giving rise to one or more tumors, as the case may be. These tumors are frequently serous in character, and are not infrequently filled with blood, as has been too often shown by puncture or otherwise. With such palpable evidence before us, it is not too much to claim that a like effusion may take place within the cranium, and if any one questions the correctness of this deduction, it can easily be sustained by consulting standard works, in which we are taught that hæmorrhage on to the surface of the brain may take place, or into its substance, and I assert, with laceration of the right hemispheres, even to a fatal extent, as one of the accidents incident to labor independent of instrumental assistance or interference—and to these *pathological lesions the physiological condition of right-handedness* is due.

These injuries, varying from the barely perceptible, to the rapidly fatal cases, produce changes in the survivors of like variable extent. The violence giving rise to the effusion of serum or blood within the cranial vault, with or without laceration of brain tissue, is a factor not to be lost sight of, and in connection with the effusions and lacerations we may get circumscribed atrophy of the brain, or modified brain tissue, as a result of secondary inflammatory action, or impaired nutrition, giving rise to permanent, weakened nervous energy, independent of the direct effect of the effusion or laceration, and these injuries may extend deeply, so as to involve not only the centre of speech of the right side, dwarfing it even to a rudimentary condition, but also to the extent of involving the origin of the right cranial nerves, at least those supplying the muscles of mastication, as may be seen by observing that right-handed people, other things being equal, masticate their food on the left side, these muscles being supplied with motor power by the left cranial nerves, which do not decussate as do the spinal nerves. By comparing the caput succedaneum of the infant at birth, with the field of motor centres of Ferrier, it will be seen at a glance, that the centre for the hand, forearm, arm and leg of the left side, are embraced in the field cov-

ered by the several points of impact during labor in the first and fourth obstetric positions; and the effect being somewhat diffused over the surrounding portions of brain tissue, it is not difficult to appreciate the very general remote effect, involving the muscles of the entire left side of the body; a condition of things heretofore never satisfactorily explained, but easily accounted for in this manner, and if no evidence of brain injury existed in these cases, other than the weakened condition of the left side of the body, that of itself would be evidence of such an injury, that cannot be explained so readily in any other manner. Any discrepancy that may exist in the exact location of the different motor centres as given by different observers, for instance, Ferrier and Horsley, is only apparent, not real, as the one locates with sharp limits and closely defined groups of muscles, while the other generalizes in his location of centres, and embraces large areas, or several systems of muscles, in his individual groupings, which, taken as a whole, correspond very closely.



Lectures on Obstetrics, Tyler Smith, p. 342, fig. 107.

R.—Right parietal bone.

L.—Left parietal bone.

1, 1, 1.—The different points of the right parietal bone which present successively in the first position.

4.—The part of the parietal bone which presents at the os uteri in the fourth position at the commencement of labor.

4 A.—The part of the parietal bone which presents at the os uteri in the fourth position, when the head is delivered in the occipito-posterior position.

4 b, 4 b.—The points of the right parietal bone which present successively when the head, presenting in the fourth position, makes the quarter turn, and is delivered in the occipito-anterior position.

The foregoing is the primary cause of right-handedness, but heredity plays a very important,

secondary part. Upwards of 70 per cent. of all natural presentations, present in a manner which we have seen tends to an injury, which favors atrophy or defective development of the right half of the brain, extending so deeply as to involve not only the centre of speech, but also the origin of the right cranial nerves.

This extreme brain lesion is not claimed for all the large per cent. of children presenting in the first and fourth positions, but it is claimed that a sufficiently large proportion of these cases does suffer as I have indicated, so that when we consider the repetition of the lesion through the thousands of years of human existence, there can be no doubt but what we have all the requirements for hereditary influence, which I consider unessential, however, and yet I consider it as a factor of no mean importance, and to illustrate the power of repetition, I quote Tyler Smith, Lectures on Obstetrics, page 318, who says: "The Caribs flattened the foreheads of their children, and the continuance of this practice through succeeding generations produced a natural flattening of the anterior part of the head, until the Carib infants were born with flat heads. Hippocrates gives an account of the Macrocephali, a Scythian race believed to have inhabited the Crimea, of whom the Father of Physic says: 'There is no other race of men which have their heads in the least resembling theirs. At first, usage was the principal cause of the length of their heads, but now nature coöperates with usage. They think those the most noble who have the longest heads. It is thus with regard to the usage: immediately after the child is born, and while its head is still tender, they fashion the head with their hands, and constrain it to assume a lengthened shape, by applying bandages and other suitable contrivances, whereby the spherical form of the head is destroyed, and it is made to increase in length. Thus at first usage operated, so that this constitution was the result of force; but in the course of time it was formed naturally, so that usage had nothing to do with it.'"

I could multiply examples indefinitely, but forbear. My position once being established, all such phenomena as the preponderance of tuberculosis of the left lung, the more frequent appearance of cancer in the left breast, and the oft commented upon, greater frequency of left lateral laceration of the cervix uteri, are at once easily explained, upon the basis of left side weakness, or left side enervation.

THE OLDEST AND LARGEST MEDICAL SOCIETY IN THE UNITED STATES.—The total active membership of the Medical Society of the County of New York is now given at over 1,100. At the last two meetings an increase of over one hundred has developed in the membership.

ADENOMA UTERI.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, at Washington, D. C., May, 1891.

BY HENRY C. COE, M.D.,
OF NEW YORK.

Introduction.—The writer formerly regarded true "malignant adenoma" of the corporeal endometrium as an extremely rare disease; late observation has convinced him that it is more common than he had supposed.

There has been very great confusion in the nomenclature of diseases of the endometrium. Mucous polypi, endometritis fungosa, true adenoma and adeno-carcinoma, have all been described as varieties of adenoma. This is not only anatomically incorrect, but leads to serious error from a clinical standpoint. Even such an acute observer and clear writer as Winckel has introduced confusion into his description of the condition. Many diagnoses are made from a microscopical examination of curettings alone. In doubtful cases, no careful pathologist will positively commit himself on such insufficient evidence. The crucial test of malignancy is *invasion of the submucous layer*; this implies examination of sections of a growth made *in situ*, after removal of the entire uterus. The writer starts out with the proposition that there is only one variety of true adenoma, and that is essentially malignant clinical. So-called "adenomatous polypus," "benign adenoma" and "endometritis fungosa," are not considered at all, since they are not true adenoma.

Brief Historical Review.—Matthews Duncan is credited with the first reported case of malignant adenoma, though the diagnosis was not supported by a subsequent autopsy. Breisky and Eppinger reported most thoroughly a *bona fide* case in 1877, which has become classical. Schroeder wrote on the subject a few months later, describing two cases, and Veit confirmed his and Breisky's views regarding the ultimate transition of adenoma to adeno-carcinoma. Mann, Bertolet, Thomas and Goodell reported supposed cases, but Mann's description (case of Lusk's) is alone convincing. The most recent communications have been by Ruge, Veit and Fürst, the former having reported a case three years ago. The writer published a communication on the subject two years ago.

The writer has examined uteri removed by Wylie and Bache Emmet, which were undoubted specimens of pure adenoma uteri, that of Wylie's being an exquisite example of the diffuse form. He has himself extirpated two uteri in which the condition was circumscribed adenoma, and one in which there was a transition to adenoma-carcinoma. All five patients made a good recovery.

[Here follow brief histories and descriptions of the writer's specimens, which were to be presented to the Section.]

General deductions from the above cases:

Anatomy.—Unnecessary to describe the ordinary microscopical appearances of adenoma. The important point is that the malignant character of adenoma of the endometrium is shown by the fact that it is not confined to the *mucosa*, but *invades the submucous and muscular layers*. Moreover, in some specimens (as in Breisky's), the transition to carcinoma has been clearly established.

Symptomatology.—There is no clearly defined set of symptoms peculiar to adenoma, but the writer does not agree with Ruge that they are never distinguishable from those of carcinoma corporis uteri. In the first place, the symptoms of adenoma are of longer standing than are those of primary carcinoma. There is less pain, the hæmorrhages are less frequent and profuse, and, so far as the writer's observation has extended, there is little or no foul-smelling, watery discharge. Glandular and perimetric involvement has been entirely absent in the four cases personally observed by the writer. The negative results of the examination of curettings is important, since there is seldom doubt in a well-marked case of carcinoma.

Diagnosis.—This is sometimes extremely difficult, yet it is of more importance from a scientific than from a surgical standpoint. Given a patient who has passed the menopause, and who has for several months had slight atypical hæmorrhages with lancinating pelvic pains, even if a foul discharge, cachexia and other characteristic symptoms be wanting, we should make a thorough examination of the interior of the uterus by means of the finger and curette, after dilatation with tents. Finding a localized or diffuse papillary growth, we are justified in removing the uterus without delay, even if the microscope shows no positive evidence of malignant disease.

Prognosis.—As the history of the few *authentic* cases of adenoma uteri has shown, the course of the disease is exceedingly slow and insidious. It is the least malignant of all the forms of malignant disease of the endometrium, but if left to itself, it inevitably assumes a more fatal form. We should not be misled by the long-continued good health of the patient, and the absence of profuse hæmorrhage, offensive discharges, and local pain and tenderness. The end, though long delayed, is certain.

Treatment.—Total extirpation of the uterus is the only treatment to be considered. Frequent curetting simply hastens the transition to the more malignant type of which adenoma is the initial stage. The patient is relieved for a time, but her symptoms soon reappear in an aggravated form. The use of the galvano-cautery, though more efficient, is no less objectionable. Remove the entire uterus. In cases of adenoma the operation is easy and uncomplicated, and there is a better prospect of a radical cure than in carcinoma, either of the cervix or corpus uteri.

Summary.—"Benignant adenoma" is a misnomer. There is only one variety of true adenoma of the corpus uteri, and that is both clinically and anatomically malignant.

Adenoma uteri is not, at the outset, identical with adeno-carcinoma, but is to be regarded as the initial stage of the latter. Its malignancy is shown by its early recurrence after removal with the sharp curette.

The symptoms of adenoma are less clearly defined than those of carcinoma, being usually slight irregular hæmorrhages, and pelvic pains extending over a long period, without cachexia and offensive discharges.

Palliative treatment is worse than useless. Total extirpation promises a radical cure if performed early, or during the pre-cancerous stage.

LAPAROTOMY WITH REPORT OF CASES.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 1891.

BY J. H. BRANHAM, M.D.,
OF BALTIMORE, MD.

The following paper is a report of the eleven laparotomies which I have done up to this time. They have all occurred during the past two years. The number is too small to be of much value from a statistical standpoint, but the difficulties met with in these cases are probably more keenly appreciated by a beginner than by an older operator, and I hope, by calling your attention to these, to make my report of value to those surgeons who are entering this field.

could not be found. The bladder, which was adherent to the anterior part of the tumor, was drawn nearly up to the umbilicus, and was opened during the operation. It was carefully closed, and the patient made an uninterrupted recovery.

Case 2.—The right ovary was displaced into the inguinal region, was enlarged, softened, beginning to suppurate, and attached to the lower part of the small intestines by recent adhesions. In separating these, about one inch of the longitudinal diameter and more than half of the circumference of the gut was denuded of peritoneal covering and looked very dark, but this did not prevent a rapid convalescence.

Case 3.—Patient had suffered for thirteen years with symptoms of pelvic inflammation accompanied by dysmenorrhœa, fainting spells, etc. She had been confined to bed for months at a time, and was constantly in pain. The ovaries were atrophied and surrounded by many adhesions, and were enucleated with much difficulty. The wound healed by first intention, and although the patient has since continued to menstruate slightly her general health is much improved, and she suffers very little pelvic pain.

Case 4.—This patient was a robust German woman, who, in addition to immense abscesses of both tubes and ovaries had a large abscess between the uterus and vagina in front and the rectum behind. In attempting to enucleate this several of the large pelvic veins were torn, and it was necessary to pack the pelvis with antiseptic gauze to control the hæmorrhage. The post-mortem showed that the abscess behind the

No. Cases	Date of Operation.	Name.	Race.	Age.	State of Children.	No. of Children.	Disease.	Operation.	Drainage.	Result.
1	Jan. 20, 1890.	Gaither T.	Col.	30	M	4	Uterine myomata.	Exploratory incision.	Yes.	Recovery.
2	Feb. 28, 1890.	Lizzie S.	White.	34	M		Right ovary displaced adherent to lower bowels, first stage of suppurative inflammation.	Right ovary and tube removed.	Yes.	Recovery.
3	April 1, 1890.	Catherine R.	White.	31	M	0	Chronic ovaritis with atrophy and adhesion.	Both tubes and ovaries removed.	Yes.	Recovery.
4	April 15, 1890.	Mary H.	White.	40	M		Very large double pyosalpinx with ovarian abscess.	Both ovaries and tubes removed.	Yes.	Death in 8 hours of shock and hæmorrhage.
5	July 7, 1890.	Mary L.	White.	31	S	2	Large right pyosalpinx.	Right tube and ovary removed.	Yes.	Recovery.
6	July 14, 1890.	Annie F.	White.	31	S	1	Enlarged and inflamed left ovary without suppuration.	Left tube and ovary removed.	No.	Recovery.
7	July 30, 1890.	Dora H.	White.	30	M	0	Dysmenorrhœa and Menorrhagia.	Both ovaries and tubes removed.	Yes.	Recovery.
8	Oct. 13.	Agnes L.	White.	26	M	1	Double abscess of tubes and ovaries.	Both tubes and ovaries removed.	Yes.	Recovery.
9	Nov. 13, 1890.	Catherine K.	White.	30	M	5	Left pyosalpinx and ovarian abscess. Right hydrosalpinx.	Both ovaries and tubes removed.	Yes.	Recovery.
10	Feb. 10, 1891.	Jane R.	Col.	37	M		Ventral hernia following laparotomy.	Omentum separated from sac, edges of peritoneum freshened and sutured.	No.	Recovery.
11	March 21, 1891.	Mary W.	White.	33	M	4	Right ovary displaced. Both ovaries fibroid and excessively tender.	Both ovaries and tubes removed.	No.	Recovery.

I will give, first, a tabulated history of the cases and then will call your attention to those points which seem to me to be of most interest.

Case 1.—Operated with intention of removing ovaries and tubes, but the tumor in its growth had surrounded them to such an extent that they

uterus could not have been enucleated without fatal result, and simple drainage would have been better.

Case 5.—Was a large pyosalpinx. Recovery rapid, and the patient is in excellent health at the present time.

Case 6.—Patient was nearly three months pregnant, which condition was suspected before the operation, but as the symptoms pointed strongly to pyosalpinx it was deemed best not to wait. The entire uterus was soft and cyst-like. The upper part as much so as the lower, which seems to be contrary to the opinion of Hager as indicated by the descriptions of his sign of pregnancy which I have seen.

The pregnancy was not interrupted and terminated normally about six months after operation. Since delivery she is said to have developed a slight hernia.

Case 7.—This case was operated on for menorrhœa, which prevented the patient from earning her living. All other methods of treatment had been tried without avail. The uterus, which was retroverted, was stitched to the abdominal wall. The patient was out of bed the night after the operation and walked the second night; notwithstanding, she recovered without fever, but developed an abdominal hernia which has since been cured by Prof. Thos. Opie.

Case 8.—Recovery uneventful except symptoms of impaction of the bowels caused by the use of morphia, and milk diet.

The use of morphia was necessary as the patient could not have a trained nurse. She is in excellent health at this time.

Case 9.—Patient had been suffering with symptoms of pelvic suppuration for nearly two years. On the right side the hydrosalpinx was attached to the broad ligament and uterus by a thick vascular pedicle in which the vessels were distended and softened, and severe hæmorrhage occurred at the time of the operation. The ligatures, which were first applied to the pedicle in the usual way, and, afterwards, to the vessels themselves, cut through, and the bleeding could only be partly arrested. Oozing continued for thirty hours, shortly after which the drainage tube was removed.

The wound suppurated and the patient was in a precarious condition for three weeks, after which she slowly improved. I was called to see her in March, and found her suffering from acute nephritis with general œdema and ascites. Under suitable treatment the albumen has disappeared from the urine and the dropsical symptoms have subsided, but she is left with a tendency to abdominal hernia.

Case 10.—The hernia here was large; the coverings consisted of the skin and superficial fascia, all the other structure being separated. The inner wall was lined with omentum which was closely adherent throughout its entire extent, and was separated with great difficulty. Since operation there has been no tendency to return.

Case 11.—Here the reflex symptoms had been very severe. Very much of her time was spent in bed and her pain was excessive. Dysmenorrhœa

and menorrhagia very great, which kept her reduced to a skeleton. Her right kidney is very movable and at times is tender. This movability, which is shared by the left to a great extent, I think is partly explained by absolute absorption of all the abdominal fat. The time is too short to judge as to the final result in this case, but the improvement to date has been marked.

Cases 1, 2, 4, 5, 6 and 7 were done in the public ward of the City Hospital of Baltimore. Case 11 was done in private room of same hospital. Case 10, public ward, Bay View Hospital. Cases 3, 8 and 9 were performed at the homes of the patients. The strictest antisepsis was observed in each operation. Drainage was accomplished by the open glass tube plugged with antiseptic cotton, the fluid being removed by an ordinary glass or rubber syringe, to which was attached a piece of soft rubber tubing.

Cases 2, 4, 5, 8 and 9 were operated on for pelvic suppuration. Results in 2, 5 and 8 were all that could be desired; case 4 died, being the only fatal result. Tendency to ventral hernia noted in cases 6, 7 and 9 was undoubtedly caused in the first by distention of the abdomen in the progress of pregnancy.

In case 6, by the unruliness of the patient, who, when not watched closely, would get out of bed, and thus dragged the sutures, which were attached to the uterus, into the abdomen, from whence they were removed with great difficulty.

In case 9, it was caused by the distention of the abdomen due to the ascites. In cases 3, 7 and 11 the operation was done to cause premature menopause. In case 3 this was not accomplished. The patient still menstruates slightly and at irregular intervals. Here the ovaries were imbedded in old adhesions, and it is quite possible that in enucleating them a small amount of stroma was left which would account for the incomplete success. In the other cases the menstruation was arrested at once.

In these cases where I have operated to bring about the menopause the patients have been hopeless invalids, all other methods having failed to relieve them.

They thoroughly understood the effects of the operations and were anxious to have it done.

I have refused to operate in a number of cases where the symptoms were not so severe as to make life unbearable.

COPPER IN CHLOROSIS.—Liégeois has obtained very satisfactory results in chlorosis from the following formula, suggested by Luton:

R. Cupri acetatis neut., gr. $\frac{1}{6}$.
Sodii phosphat. cryst., gr. $\frac{3}{4}$.
Pulv. glycyrrhizæ, āā q. s.
Glycerinæ, āā q. s. ℞.

Ft. pil. no. j.

One or two pills before eating, noon and night.

THE ETIOLOGY OF DIPHTHERIA.

Read in the Section of Practice of Medicine and Physiology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5-8, 1891.

BY J. LEWIS SMITH, M.D.,
OF NEW YORK CITY.

No other infectious disease of childhood has been so much investigated in recent years as diphtheria. It has been the subject of full and accurate study by the most distinguished clinical instructors in both hemispheres, and numerous microscopic examinations and experiments with cultures of its specific principle have thrown light on its nature. Nevertheless, it has continued to extend and destroy its victims. It has encircled the globe, occurring with a heavy mortality in every country reached by commerce or travel. We read in medical journals of its prevalence, with the usual death rate, in Brazil, Algiers, and in distant Australia. It has occurred for ages in Eastern Asia, where it probably originated, and the complex prescriptions of the Chinese doctors, which have descended as an inheritance with little variation from their ancestors, and which are frequently employed by European residents of China, have lately been added to the literature of this disease.

Notwithstanding the many discussions of the treatment of diphtheria in medical societies, the many remedies which have been employed, and the additional light thrown upon its nature by the discovery of its cause, the percentage of deaths from this disease continues large. A recent French writer on diphtheria states that the deaths in France are in numerical excess of the births, and largely on account of the prevalence of this disease. In London the mortality from diphtheria has been steadily increasing. Within the metropolitan registration area it caused 952 deaths in 1887, 1,311 deaths in 1888, and 1,588 deaths in 1889. These numbers would be greatly increased if the deaths reported from croup, which, wherever diphtheria is prevailing, is known to be, with few exceptions, a manifestation of this disease, were added to them. (*London Lancet*, May 17, 1890.) In New York City the deaths from diphtheria were 1,914, and from croup 639, aggregate 2,553 in 1888; from diphtheria 1,686, and from croup 605, aggregate 2,291 in 1889. In Brooklyn the deaths from diphtheria were 984, and from croup 391 in 1889; from diphtheria 1,101, and from croup 366 in 1890. These are probably the average statistics of the mortality from diphtheria in the cities where it prevails.

The presence of a great evil always leads to strenuous efforts to determine the exact nature and the most effectual mode of combatting it. It is now known that diphtheria is produced by a linear or rod-shape microörganism, having about the length of the one which causes tuber-

culosis, but considerably thicker. A rod-shape microbe is termed a bacillus, and that which causes diphtheria, is designated the Klebs-Löffler bacillus in honor of Klebs, who announced his discovery of it in 1883, and of Löffler, who subsequently more thoroughly investigated its nature. Löffler cultivated it in appropriate media, and after a succession of cultivations, which removed it several generations from its source in the child, inoculated pigeons, rabbits and guinea pigs, with the last culture, and produced in them typical diphtheritic inflammation. Many others have repeated and varied these experiments with results similar to those obtained by Löffler, so that the theory that diphtheria is caused by the Klebs-Löffler bacillus is accepted. This bacillus presents aspects which to the experienced eye are characteristic. It often has a granular appearance and is stained in two minutes by the violet of methyle; it often exhibits a more intense coloration of its extremities than of its central parts, and its extremities are sometimes swollen so as to present a dumb bell appearance, or only one extremity is swollen, so that it has the shape of a pear or gourd; occasionally it is curved like an arc. (*Le Bulletin Med.*, June 15, 1890.)

The Klebs-Löffler bacillus alighting upon the faucial or other mucous surface, or the skin denuded of its epidermis, obtains a nidus favorable for its development and propagation, but it does not enter the interior of the system; it is not taken up by the lymph ducts or blood vessels and conveyed to the internal organs; it remains localized upon the surface and produces there the characteristic inflammation; acting solely upon superficial parts, it cannot in itself produce systemic infection, or blood-poisoning, but like as the venomous reptile or the bee secretes its poison, which it communicates by its fang or its sting, it produces a chemical poison, which is readily taken up by the vessels and conveyed to the internal and vital organs.

This substance, which is the poisonous agent in diphtheria, and which produces systemic infection and death of the multitudes who perish from diphtheritic blood-poisoning, has been carefully examined and experimented with by L. Brieger and K. Fraenkel (*Berliner Klinische Wochen.*, March 17th and 24th, 1890). They say that it may be evaporated at 122°, but is destroyed by a heat above 140°. It is soluble in water, but is insoluble in alcohol. It is not precipitated by ebullition, nor by the following medicinal agents: sulphate of sodium, sulphate of magnesium, chloride of sodium, nitric acid and acetate of lead. On the other hand, it is precipitated by concentrated carbonic acid, the ferro-cyanide of potassium, acetic acid, carbolic acid and nitrate of silver. It has, say Brieger and Fraenkel, the following composition: Carbon, 45.35; hydro-

gen, 7.13; azote, 16.33; sulphur, 1.39; oxygen, 29.80.

When it was separated from the bacillus by passing through the porcelain filter, and inoculated in rabbits and guinea pigs, it caused death in the small quantity of two and a half milligrams to each kilogram in the weight of the animal. Sometimes death did not occur until after weeks or months, while the bacillus itself inoculated upon one of the surfaces, caused inflammation with the exudation of fibrin, producing the diphtheritic pseudo-membrane, this chemical product of the bacillus, freed from the bacillus by the filter, did not, when inoculated, cause any fibrinous exudation or diphtheritic pellicle, though its action was so highly poisonous. According to Brieger and Fraenkel it is allied in its composition to the proteids or albuminoids, and it bears considerable resemblance to ichthyotoxicon, the poison secreted by sea eels. Many years ago Trousseau noticed this resemblance and related an instance in which seamen became paralyzed, some of them for three months, by eating a cooked eel. He saw the resemblance in these cases to diphtheritic paralysis. In a vacuum the poison produced by the Klebs-Löffler bacillus retains its virulence for weeks or months. MM. Roux and Yersin state in the records of the Pasteur Institute, Paris, that their investigations have strengthened the belief that the Klebs-Löffler bacillus is in itself comparatively innocuous, the chemical substance produced by it, described above, being the poisonous principle. These bacteriologists also separated this substance from the bacillus by filtration through a porcelain filter, and by inoculating dogs and sheep with it, produced in them a paralysis apparently identical with that occurring in children from diphtheria. Roux and Yersin also state that while the filtered liquid freed from the bacillus, and containing only the chemical substance, if infected under the skin of rabbits and guinea pigs, was very fatal, it caused little inconvenience, if introduced into the stomach.

Experiments similar to those related above, and clinical observations confirmatory of the views expressed by Klebs-Löffler, Roux and Yersin, have been made by many others, which, since they are in the main corroborative, need not be related here.

Pseudo-diphtheria.—This term is employed through want of a better one. It is proper to state in this connection that clinical observations and experiments, carefully made, have demonstrated the fact that certain other microbes besides the Klebs-Löffler bacillus, sometimes produce a pseudo-membranous inflammation upon the faucial or other surface, which as regards its anatomical characters, appears to be identical with that in true diphtheria. The only differ-

ence thus far discovered has been the absence of the Klebs-Löffler bacillus, and the presence of other microbes. Whether these other microbes produce poisonous albuminoids by which the system becomes infected must be determined by future research, but if they do, these products seem to be different from that generated by the Klebs-Löffler bacillus, for the peculiar paralysis which is so common in true diphtheria does not appear to occur, or is infrequent in pseudo-diphtheria. If the systemic infection be different in true diphtheria and pseudo-diphtheria, as appears to be the case, we see the propriety of recognizing two distinct diseases, just as our ancestors differentiated measles and scarlet fever, which, since both had a cutaneous efflorescence and redness of the fauces, were formerly considered identical.

M. Talamon states that not only other microbes, besides the Klebs-Löffler bacillus, but also certain irritating medicinal and chemical agents, have the power to excite an inflammation with fibrinous exudation upon the faucial, or other surface, to which they are applied, which cannot be distinguished by its appearance and anatomical characters from that of true diphtheria except by the absence of the cause of the latter disease, to wit, the Klebs-Löffler bacillus. The inflammation produced by non-microbic irritating agents, as steam, boiling water, chlorine, cantharides, and ammonia, though attended by an exudation of fibrin, is obviously entirely distinct in nature, from that caused by microbic agency. Like any inflammation from traumatism, it always remains a local disease, and must not be confounded with diphtheria or pseudo-diphtheria.

Pseudo-diphtheria, according to my observations in the institutions and in family practice, occurs most frequently in the course of the eruptive fevers, and especially in scarlet fever. We must not mistake the necrosis or gangrene which is not uncommon upon the swollen fauces, in severe anginous scarlet fever, for a fibrinous exudation. It is difficult, perhaps in some cases impossible, to distinguish the one from the other on inspecting the fauces. Necrosis occurs upon the most swollen part, as over the tonsils or in their vicinity. A fibrinous exudation due to microbic agency is likely to extend to the velum or uvula. Diphtheria or pseudo-diphtheria complicating scarlet fever usually occurs when there is not sufficient tumefaction to cause necrosis, but it may supervene upon, and complicate a necrosis.

M. Sevestre, of Paris, says that the pseudo-membranous sore-throat, which occasionally occurs in scarlet fever, is generally considered in France as having a diphtheritic origin, and patients who are suffering from it are placed in the diphtheritic ward. It is, however, says he, a variety of sore throat, which ought to be dis-

tinguished from the diphtheritic. It is an early manifestation developing in the first days of scarlet fever. It is characterized by the production of white patches, which frequently are exactly similar to those of diphtheria, and which may occur upon the uvula and soft palate, so that its diagnosis from diphtheritic inflammation is often very difficult, but the pseudo-membrane does not extend to the larynx, and the general condition of the patients remains, in most cases, satisfactory. These sore-throats, adds Sevestre, commonly end in recovery, and they do not communicate diphtheria to neighboring children. Some of the patients alluded to by Sevestre, evidently had what we have designated pseudo-diphtheria, an inflammation with fibrinous exudation produced by other microbes than the Klebs-Löffler bacillus, probably mainly by cocci, which are found in abundance in these cases. Some of the patients referred to by Sevestre, perhaps had scarlatinal necrosis. MM. Wartz and Bourges made microscopic examinations in nine cases of supposed diphtheria, complicating scarlet fever. In two of the cases in which the pseudo-membranous inflammation occurred at a late stage of scarlet fever, the Klebs-Löffler bacillus was found in the exudate, but in the other cases, in which the pseudo-membrane appeared early, this bacillus was not present, but streptococci were abundant. In six of the cases the pyogenic staphylococcus was also observed (*Arch. de Med.*, May, 1890). The fact that the Klebs-Löffler bacillus did not occur in cases in which a pseudo-membranous exudate appeared at an early stage of scarlet fever, justifies the belief, the writers say, that the appearance upon the faucial surface, which so closely resembled that in diphtheria, was due to the intensity of the scarlatinal inflammation. But in the two cases, in which the pseudo-membrane appeared at an advanced stage (the sixth and ninth days), the Klebs-Löffler bacillus was present, and it is evident that true diphtheria had supervened.

We might quote the observations of Prof. Henoch, of Berlin, and Dr. McWerney, of the Royal Academy of Medicine of Ireland, showing that in scarlet fever the faucial inflammation, accompanied by the formation of a pellicle, so closely resembles that of diphtheria that it is difficult to make the differential diagnosis. But this inflammation is not followed by paralysis except when true diphtheria supervenes. It is caused by the agency of the scarlatinal, and other microbes than the Klebs-Löffler bacillus.

The *American Journal of Medical Sciences* for May, 1889, contains an elaborate paper by Prof. T. M. Prudden, relating the microscopic examinations of the pseudo-membrane underlying tissues and the viscera, removed from the bodies of 24 children, who were supposed to have perished from diphtheria. But these cases, with two

exceptions, were treated in institutions, where epidemics of the other infectious diseases are frequent, and sixteen of them had scarlet fever, measles, whooping cough, or an erysipelatous or phlegmonous inflammation, in parts at a distance from the fauces at the time of death. In no one of these specimens sent to Dr. Prudden by curators or reputable physicians, in the belief that they were removed from the bodies of those who had died of true diphtheria, could he find the Klebs-Löffler bacillus, but instead he discovered the streptococcus and staphylococcus. These specimens for a time misled Dr. Prudden and the entire medical profession in this country, for the absence of the Klebs-Löffler bacillus in the specimens of twenty-four consecutive cases seemed to show that this bacillus could not be the cause of diphtheria. But in no one of these cases so far as their histories show, did paralysis, which is so characteristic of true diphtheria, occur. These twenty-four patients died from a disease produced by the agency of other microbes than the Klebs-Löffler bacillus, or what we, through want of a better term, have designated pseudo-diphtheria. Prof. Prudden has since discovered the Klebs-Löffler bacillus in a dozen or more cases of true diphtheria. Prof. Welch, of Johns Hopkins University, also finds the Klebs-Löffler bacillus in diphtheria, has obtained cultures of it, and by inoculating animals with these cultures has apparently produced the genuine disease in them; therefore he believes that the theory that this organism causes diphtheria is fully established.

From the facts as stated above we repeat that the disease heretofore designated diphtheria we must now regard as two diseases, to wit: diphtheria resulting from the action of the Klebs-Löffler bacillus, and pseudo-diphtheria, resulting from the agency of other microbes, or else we must recognize two varieties, or rather forms, of diphtheria, the one caused by the Klebs-Löffler bacillus and the other by other microbes. I may add that there is no evidence, so far as I have been able to ascertain, that the poisonous albuminoid generated by the Klebs-Löffler bacillus, which albuminoid causes the systemic affection, or blood-poisoning in true diphtheria, is produced by any other microbe. If the streptococcus, staphylococcus or any other form of coccus produces a poisonous albuminoid similar to that generated by the Klebs-Löffler bacillus, I am not aware that it has been discovered or isolated.

In the light of our present knowledge are we able to state whether diphtheria is primarily a local or primarily a constitutional disease? It seems that we must regard the disease produced by the Klebs-Löffler bacillus as primarily local; but in reference to the disease produced by other microbes the question is still an open one, for in fatal cases the micrococcus is found in internal organs, as well as at the seat of the inflammation

upon the mucous surface. The length of this paper prevents our discussing the very important subject of the modes of propagation of diphtheria, which must be reserved for some other occasion.

PREMENSTRUAL PAIN AND CONVOLUTED TUBES.

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The views in this article occurred to me from the examination of about 700 ova ducts of man, cow, pig, sheep and dog. The substance of the views is that the main premenstrual pain and the pain which women have who are afflicted with tubal disease is essentially due to peristalsis or vermicular motion of the tubes themselves. It is, in short, tubal colic. The method of arriving at this idea was the following:

Four years ago I wished to acquire a practical knowledge of the heart and its diseases, so I dissected and examined a large number of the hearts of all animals within range of acquisition. Considerable vivisection was done. It does not require but few vivisections to demonstrate that the essential motive power of the heart is situated in its base. That the main ganglia which control and initiate regular movements to the heart reside in the auricles and not the ventricles. The nerve ganglia which give the heart its *rhythm* belong to its basal portion. These ganglia are called Remak's, Ludwig's, Bidder's and Schmidt's, and are well termed automatic cardiac ganglia. It is easy to observe the heart die out from apex to base. If the vivisection is carefully done the auricles (in the dog) will beat regular considerable time after the ventricles have ceased their rhythmical action, so I saw that the heart (which is one of the viscera) had some nerve apparatus within itself which gave it a rhythmical, periodical, cyclical motion. The heart waxed to a maximum and waned to a minimum in its continual motion. In short, it exploded about 75 times a minute.

Three years ago I wished to acquire a similar practical knowledge of the intestines and their pathology. So we included in the examination and dissection the above mentioned animals, but especially the dog, on which the main vivisection was done. To demonstrate the point, the dogs were chloroformed and the abdomen opened. The intestines were generally found still and quietly at rest until the exposure to air stimulated them to move slightly. The dog was nearly always chloroformed to death inside of twenty minutes. But after the dog was dead the intestines, by simply tapping them, would go through their peristalsis, their vericula, periodical *rhythmical*

cal motion for at least an hour. If the temperature was 80 degrees the cyclical movements could be kept up an hour and a half. In such experiments alone can be realized what is known as the "invagination of death." Now the same phenomenon which was seen in the action of the heart, is again witnessed in the intestines. It is *rhythmical* motion and must be caused by the same kind of an apparatus known as a ganglion. In fact the ganglia which do the motive work of the intestines are situated in the plexus of Auerbach and the plexus of Meissner. These plexuses reside in the gut wall. The same form of work can be done with the kidney and bladder and the same kind of ganglia found. They are *rhythmical* ganglia. It may be remembered that a nerve ganglion is a little brain. It is an automatic center. It is a sensorium of independent action. A ganglion is possessed with the powers of secretion and nutrition. It is a physiological center endowed with plenipotentiary power to initiate, continue and prohibit action. The function of a ganglion is to produce a rhythm. It is a nerve apparatus which wanes and waxes and explodes. It lives a periodic, cyclical life and the circle of its action is defined by its maximum and minimum points—in time.

Now, this same kind of experimental work was applied to the Fallopian tubes of man, cow, dog, sheep, and pigs. Many hundred ova ducts of the higher animals were carefully examined and lately, while studying with Mr. Lawson Tait, I have had plenty of opportunity to confirm the experiments on fresh human tubes, a few minutes after Mr. Tait had removed them from the patient. Some of the tubes were absolutely healthy, as they were removed for bleeding myoma and other causes. It may be remarked that the Fallopian tubes do not differ from other hollow viscera. They are governed by similar nervous apparatus. The tubes live a rhythmical life. They have a periodic function, and while useful to woman go through cyclical action. After considerable investigation and microscopical work I came to the conclusion that the tubes (and uterus) were governed in their rhythm by ganglia situated along their walls, and along the blood vessels which supply them. In order that these ganglia should be appropriately named, I styled them *automatic menstrual ganglia*.

Until some two years ago, when I began to investigate this subject, I had no idea of the importance of the tubes in the process of menstruation. But now I am becoming convinced that the tubes overshadow every other organ in menstruation. It seems to me that menstruation starts in the tubes and begins with tubal motion. The girl's puberty is heralded by tubal activity, and she is a woman when her tubes begin to move. (I am unable to find any difference in the ovaries at puberty except increased vascularity, and hence

a hastening in maturation of ova). The importance of the tubes in menstruation is best impressed on the mind when we consider their object. The whole business of a tube is to transport an ovum into the uterus from the ovary. As ovulation is a constant and progressive process, it has no periodicity to it. Ovulation has no monthly *rhythm*. An ovum simply bursts when it matures and we do not yet know the life and duration of a graafian follicle.

But menstruation is periodic and *rhythmic*. It is not strange that the essential change in menstruation should occur in the organ most concerned in the process—the tube. The tube must be prepared before it can either secure an ovum or transmit it along its canal. A still, dry contracted tube has really poor facilities for transporting an egg down to the uterus. But wait and observe the tubes awhile before menstruation. The automatic menstrual ganglia become active. As these ganglia approach and wax to a maximum the blood vessels of the tube gradually increase in size. The walls of the tube grow redder and redder until at the climax of menstruation, the tubal vessels are so full of blood that they present a dusky blue color. Step by step as the vessels dilate the automatic menstrual ganglia impart to the tube a vermicular motion, a peristaltic action, especially toward the fimbriated extremity, and this fringed funnel is drawn towards the ovary by the shortening of the muscle which holds the ovary to the fimbria of the tube. The mouth will then drop over the ovary and secure any ovum that may *accidentally* be ripe. At the same time that the tubes become vermicular motion and the blood vessels dilate and exudation of fluid takes place in the tube which serves as a medium to float the egg down its channel. Hence the automatic menstrual ganglia prepare the tube to float an egg through its channel by giving the tube a vermicular or peristaltic motion, by enticing excessive blood in its vessels, and by inducing exudation of fluid in the tube to serve as a floating medium. Therefore the tubes are not mere ornaments of curiosity but the central organ of menstruation. If a fresh, healthy tube be just removed from a woman be squeezed between the finger and thumb at some point, a distinct circular structure will slowly but *rhythmically* follow. At the same time the longitudinal muscular layer will contract and bulge up on each side of the circular structure. Both muscular layers of the tube will act in precisely the same manner as those of an intestine under similar circumstances. This point can be easily verified by watching the end of the Fallopian tube when it is amputated from the uterus. The longitudinal muscular layer of the tube will by contraction draw its fibres away from the end while the circular muscular fibers will constrict themselves into a distinct cone—a point which aids in

recognizing the tube. This vermicular or peristaltic action of the tubes will continue under blood temperature for some half hour if one applies irritation. Hence after an observation of a large number of fresh tubes from healthy animals and also an opportunity to observe the tubes fresh from women in the operations of various surgeons, and particularly in Mr. Lawson Tait's practice, I am more and more, the past few years, convinced of the dominant influence of the tubes in starting and maintaining menstruation. That the tubes properly prepare themselves for the only object of menstruation which is to get an ovum from the ovary to the uterus. The menstrual process, or in other words, tubal motion is initiated, maintained and concluded by the machinery which I have termed automatic menstrual ganglia. But what has all this to do with premenstrual pain and convoluted or contorted tubes? If we know the structure and function, the pathology is clearer. For some time I have observed that many diseased tubes had a spiral or corkscrew shape. In one particular case of removal of the tubes of an infantile uterus, the tube was less than three inches long, but was exactly in the shape of a cork screw. It had an angular, spiral twist. This tube was from a woman who never had a child or conception. The tube was, so far as I could see, absolutely healthy. It had the longitudinal and circular muscular layers healthy, as well as its mucous membrane and ciliated epithelium. Whence came the contortion or spiral bending? I noticed in the young of animals before birth, and for some time after, that the ova ducts are curled and spiral. As time goes on the tubes gradually straighten out toward their functional period. Now, the same spiral bending is observed in human foetal life, and for some time after approaching puberty or tubal motion. So we may say that the spiral, contorted tube is a relic of foetal and early life. In cases of infantile uterus the tubes occasionally retain the foetal condition in some degree. But how are we to account for most diseased tubes being contorted, because most of the diseased tubes belong to women who have had children. Of course these tubes have been once straightened out, for they performed the motion by which an egg floated into the uterus and developed into an ovum.

It is likely that the main idea is atavism, a reversion of type to foetal state. But I notice that the spiral of the foetal tube is regular, while the spiral of the diseased tube is sometimes very irregular. If one will measure the Fallopian tube at the end of pregnancy it will be found lengthened almost twice as long as when in the non-pregnant state. This means that the individual muscles, the external longitudinal layer, are hypertrophied to nearly their ordinary length. But the calibre of the tube or its lumen is not

very much enlarged. This means that the circular or internal muscular layer of the tube does not hypertrophy very much. Hence, the external longitudinal muscular layer hypertrophies with the uterus during pregnancy. This hypertrophy requires a return to normal. It demands involution.

Now, if this involution goes on in an *irregular* manner, the tubal reduction will be uneven, and in this way the tube will become contorted. It is well to remember that the broad ligament or peritoneal covering of the tube does not hinder the tube from becoming contorted but very slightly, unless there has been inflammation of the peritoneum covering the tube. The tube lies loosely, in connective tissue, between the broad ligament, so that it will glide about between the finger and thumb if compressed. The peritoneum can easily be stripped off of the tube. Another remarkable fact I noted with some surprise, was that the peritoneum around the tube did not dip down in the depressions between the angles or bends of the tube, but stretched across them like a diaphragm. In cases of tubal removals for infantile uterus this is occasionally quite noticeable. The tube will lie curled up between the broad ligament like a cork screw with some degree of a regular spiral. However, in multipara the tubes which become contorted have not such a uniform regular spiral bending as nullipara, but present a sacculated bulging at the angles of the bends not unlike a distended intestine. The calibre or lumen of diseased tubes, becomes irregularly dilated, and the irregular dilatation nearly always occurs toward the fimbriated end. The application of these observations becomes reasonable and useful. The tubes are just like any other hollow viscera. They are provided with a nervous apparatus to induce motion or peristalsis. The tubes seem to have an inherent tendency to revert to foetal type or to a spiral condition.

Hence, when any inflammatory disease begins in the mucous membrane, the tendency is to show pathological changes at the fimbriated end first. This irritative condition of the fimbriated end sooner or later occludes the tube by blocking up the lumen with adhesions or inflammatory products. The uterine end is not often occluded in fact, but becomes impassable to fluids by the excessive swelling and angular bendings of the mucous membrane at that point. Now, we have fluids really confined in the tube. Inflammations and adhesions have stopped up the fimbriated end, and swollen mucous membrane has blocked up the uterine end. Under natural and diseased conditions the secretions of the tube accumulate. Hence arises the excessive and painful vermicular or peristaltic motion of the tube, from irritation of the diseased secretions on the automatic menstrual ganglia that control its action. This vermicular or peristaltic motion is tubal colic.

Tubal colic is premenstrual pain. It is pathognomonic of tubal disease. When the intestines have wind or offending material in them, they become occasionally violent in peristaltic movements in order to expel the material (colic). The tubes do precisely the same thing to get rid of their irritating secretions. When both ends of the tubes are closed the peristalsis may become violent, and then the tubal colic is intensely painful and sickening. The ganglionic nature of tubal motion and colic is seen in various cases. The other day I examined a woman who had tubal disease of long duration. She was examined very gently, but the irritation of the examination brought on tubal peristalsis, and of course tubal colic. I carefully inquired of her how long the pain would last from the examination. Her own statement was, when it was once started, it lasted almost *two hours*.

Now, the violent peristalsis of the tubes on the *confined* fluids is what causes the dilatation and thinning of the walls. The greatest dilatation of the tubal wall will be at the bends or angles which will be the points where the expanding force is the most active. In general, this occurs at the abdominal end of the tube. Considerable observation of the fact that, from those women who suffered long with tubal colic, the operation generally produced the convoluted or contorted Fallopian tube, convinced me that convoluted tubes is a frequent occurrence. The pain in these convoluted tubes give rise to from peristalsis, is what induces the woman to seek aid in her distress. I shall venture a step farther, and say that premenstrual pain is nearly always tubal and that the gynecologists whom I have heard instruct with such confidence and authority that premenstrual pain was from the uterus, will have to draw their views more to the horns of the uterus, if they want their assertions to agree with facts. It is not to be wondered at that walking or movement induces violent tubal peristalsis and consequent tubal colic in a tube filled and occluded with stinking pus. These women know that rest is the only thing that stops their hopeless tubal pain. To irritate the automatic menstrual ganglia into action in a pus tube, is generally a half two hours of fateful agony. One of the best proofs that tubal peristalsis is premenstrual pain is that that the pain is periodic, or worse at menstruation. When the automatic menstrual ganglia are at their climax of activity, the tubes are most active in motion. They are most congested and adding new secretions to the already pathological one. These new secretions only intensify the irritations and increase the tubal peristalsis which simply adds agony to suffering. However, in these diseases the automatic menstrual ganglia work their own destruction. They are overexcited by irritative secretions, and in this excitement and super-peristalsis of the tubes

muscular walls are rapidly dilated (by action and pressure of new-formed tissue), until the muscular layers are too thin or too much destroyed to respond to the ganglia, and thus the tubal colic loses some of its acuteness. The woman then becomes a real invalid, instead of a really acutely sick woman. It would be hopeful if the woman with diseased tubes could look for her deliverance from misery at the menopause, when the automatic menstrual ganglia will cease their temporary functional activity, but this she cannot always do, from the very fact that the disease has for years involved the contiguous tissue and organs. The disease has boldly progressed into fields foreign to the tubes, and left the woman with a damaged organism which no menopause can remove, and the head and front cause of tubal disease is gonorrhœa—a present spreading luxury of modern refined civilization.

MEDICAL PROGRESS.

CAPACITY OF THE SPINAL CANAL.—The results of certain experiments undertaken by Professor Reid and Dr. Sherrington, with a view to determining the result of position on the capacity of the spinal canal, are related in the last number of *Brain*. The plan of experiment was as follows: After trepanning over the vortex close to the longitudinal sinus, the dura mater was removed to an extent corresponding with the trepan hole. Water was then poured into the subdural space until it filled it, and a glass tube was next secured in the hole in a perfectly watertight fashion, a thin membrane which floated on the water filling the subdural space, having been previously drawn over the end of the tube.

A piece of glass tubing was connected with the other tube by flexible water-tight joints, the farther end of this tube being on a level with the trepan hole in the skull. Finally, this tube and its connections were filled with water and its free end projected over the scale pan of a sensitive balance, the other arm of which had a recording apparatus marking a revolving cylinder attached to it. The cadaver was suspended by means of an iron coronet, and variations in position were with the aid of a horizontal bar from the vertical stand on which the body was hung. The conclusions arrived at are that the capacity of the cranio-vertebral canal is at its maximum when the body is hanging freely and vertically, that there is diminution in this capacity when the weight of the trunk and limbs is taken off, and also when the vertebral column is bent backward or forward. In other words, it is found by this method of investigation that the alterations in the curvatures of the spinal canal by various movements do influence the capacity of the canal,

but not to any great extent. This variation is found to be greater in the child than in the adult. The authors conclude by remarking that this increase is so small that it becomes difficult to conceive how in the suspension treatment for cases of tubes there can, as has sometimes been claimed, be any actual stretching of the spinal cord.—*Lancet*.

A NEW METHOD OF DRESSING THE CHEST IN PNEUMONIA, PLEURISY, PLEURODYNIA, ETC.—Apply the dressing on a large scale, in the same way that we now dress abrasions, bruises, etc.

If there is to be any cupping or other preliminary operation, have that attended to; then all the ingredients wanting are pure collodion and absorbent cotton in smooth layers, and a good broad brush, like mucilage brushes.

Apply a very thin layer over the side affected from spinal column to sternum, and secure it with collodion smeared thoroughly over it. Then go on with thick layers, securing them with collodion until a good padding is obtained, paying particular attention to the edges. In double cases you can act accordingly. The advantages are:

1. The one dressing, if well applied, will last throughout the case, and so,

2. The fatigue and discomfort of frequent poulticing are avoided.

3. The side, in single cases, is held as in a splint, while the free side does the breathing. A first-class non-conductor is covering the chest. I am not sure but that the contracting collodion may have some influence in controlling the blood supply.

4. There is no particular interference, in one who has a good ear, with physical examination. May be it would be a good thing if there was; for, once having made the diagnosis, what is the use of exhausting the patient every day by trying to find out whether one-eighth of an inch, more or less, is involved? The general symptoms will tell that.—*Arch. of Gyn. and Pæd.*

INFECTION THROUGH THE SOIL.—The question is often raised whether there is any direct or indirect proof of the infectivity of the bodies of those dying from specific fevers, or whether the soil of graveyards may become really dangerously contaminated thereby, but it is also one to which comparatively little attention has been given by the experimentalist. One aspect of the matter has been lately studied by Dr. Justyn Karlinski, of Konjica, Herzegovina, in a series of experiments (*Centralblatt f. Bakteriöl.*, ix, 13) undertaken to determine whether the organs of the body undergo any change in temperature during the natural process of decomposition after burial in the earth, and especially whether any differences in this regard are to be met with in the case of infected subjects. His results show

that invariably the putrefactive process is accompanied by a rise of temperature above that of the circumjacent soil; and also that this rise in temperature is markedly higher when the parts examined have been taken from the bodies of men or animals who have succumbed to infective diseases than it is in the case of healthy bodies. He further examined into the question of the survival of the pathogenic bacteria in the affected parts, and states that the typhoid bacilli may retain their vitality in the decomposing spleen for three months, and are only completely annihilated by rapid putrefaction and the presence of a large number of the bacteria of putrefaction. Dr. Karlinkski says that he had previously shown that typhoid bacilli could retain their vitality for a period of five months in soil, but that if the earth were thoroughly saturated with rain water they were destroyed in from seven to fourteen days. The part played by the soil in the origin of epidemics should not, he thinks, be under-estimated, since typhoid bacilli can only exist in water a comparatively short time.—*The Lancet*.

A MOTHER'S RESPONSIBILITY.—The child's doctor is daily impressed with the thought that there should be a special chair in every school for girls, for the purpose of accomplishing a mild degree of training in the direction of maternal duty. The innocent ignorance of mothers has much to do with occasioning disease in their children. Allusion is not made now to the neglect of hygiene, but to the failure on the part of the mother to recognize that she has in her child a bundle of nerves far more sensitive than her own. How often we see children that are fed and immediately afterward trotted and churned to the point of complete indigestion, and when discomfort results, they are given more of the same treatment. An incident noticed to-day in the round of practice, reminds me that even among those seemingly intelligent we find errors of this kind committed. The mother of the little one to whom we were called, backed up by her grandmother, insisted that when the baby, after nursing heartily, evidently had wind upon its stomach, that shaking and trotting upon the knee would assist in its relief. When asked how she would like it if, after being overfilled with food, some one eight or ten times as large should take her and pound her up and down with a view of adding to her comfort, she realized the point that was made. She is not the only mother, and grandmother as well, who though well informed in other directions, is ignorant of the fact that babies are but miniatures of ourselves: that their feeding should be systematic; the proper material given and the quantity not too much but just enough, and that immediately following the meal, a restful position is preferable to excitement and exercise.

In the infant, regularity of feeding and restfulness after feeding should be insisted upon. We started out to draw attention to the failures of mothers to pay due respect to the nerves of their offspring, not only in infantile life but all during child-life. Abruptness, harshness, fretfulness and irritability upon the part of the mother will beget the similar conditions in the child, and how often have we seen the little one punished for following the example set by its mother.

What a pity that the strong-minded women of the world do not centre their intellectual efforts toward the education of the mothers of the land in the direction of the better care of their babies. Unfortunately, excessive intellectual development on the part of woman not only takes her away from the field of fruit-bearers herself, but also develops her taste for things foreign to her nature. The problems connected with social life and the home might be elucidated for the general good, if these great women thinkers and workers did their duty; but maternity, domesticity and wifehood seemingly are farthest from the consideration of these metal amazons. Suffrage, statecraft and teetotalism seem more to their tastes. They forget, apparently, that which tends much to the good of the world is expressed in the lines that

"Let man rule the world, 'tis nature's plan;
While woman, by her sweetness, governs man."
—*Medical Mirror*.

PATHOLOGY OF GRIEF.

That severe mental distress or fright sometimes produces physical disease, and occasionally even death, is an admitted fact, although the way in which it acts has hitherto been but little studied. In order in some measure to supply the deficiency in our knowledge regarding this matter, Dr. G. Bassi has recently made a number of observations on animals which apparently died in consequence of capture. Birds, moles, and a dog which had succumbed to conditions believed by Dr. Bassi to resemble those known amongst human beings as acute nostalgia and a "broken heart" were examined post-mortem. Generally there was hyperæmia, sometimes associated with capillary hæmorrhages of the abdominal organs, more especially of the liver, also fatty and granular degeneration of their elements, and sometimes bile was found in the stomach with or without a catarrhal condition. The clinical symptoms were at first those of excitement, especially in the birds, these being followed by depression and persistent anorexia. The theory suggested by Dr. Bassi is that the nervous disturbance interferes with the due nutrition of the tissues in such a way as to give rise to the formation of toxic substances—probably ptomaines—which then set up acute degeneration of the parenchymatous elements similar to that which occurs in consequence of the action of certain poisonous substances such as phosphorus, or to that met with in some infectious diseases. In support of this view, he points out that Schule has found parenchymatous degeneration in persons dead from acute delirium, and that Zenker found hæmorrhages in the pancreas in persons who had died suddenly; he refers also to some well-known facts concerning negroes in a state of slavery and to the occasional occurrence of jaundice after fright.—*The Lancet*.

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The Board of Trustees shall have full discretionary power to omit from the published *Transactions*, in part or in whole, any paper that may be referred to it by the Association, or either of the Sections, unless specially instructed to the contrary by vote of the Association.

NE TENTES AUT PERFICE.

It is apparent, to even the careless reader of the daily papers, that medical topics are receiving vastly more attention than ever before. It is even hinted that many large daily papers have a medical man on their regular staff; if such is the case they have generally succeeded in concealing the fact by displaying a phenomenal ignorance regarding medical subjects.

We clip the following from a prominent Chicago daily, whose medical department has lately occupied itself in exploiting Dr. Keeley's cure of inebriety, and the Shurly-Gibbes method of treating consumption as exemplified in the practice of a young Chicago physician:

A recent article in *The Tribune*, based on "Lagrange's Physiology of Bodily Exercise," explained the philosophy of the process by which great suffering or death follows undue exercise of the muscles in man, horses, and other animals. It is a fact amply demonstrated by the scientific physiologists that every exhibition of muscular force is accompanied by a disintegration of tissue, the quantity of matter thrown off being proportional to the amount of exertion. This material is carried by the veins to the lungs, where it combines with inspired (in-breathed) oxygen to form carbonic acid gas and is then expired into the atmosphere. If that effete matter be supplied to the lungs faster than it can be taken up by the oxygen, the uncombined portion acts as a poison. The effort of the system to get rid of it before succumbing to its deadly effects manifests itself in what is popularly known as "shortness of breath," though this is a misnomer, the difficulty experienced being not in filling the lungs but in getting rid of their contents. The greatest muscular exertion of which man or horse is capable furnishes this poisonous matter at least twice as fast as it can be thrown off immediately. If the action be brief the system soon finds relief, but if too long continued the poisonous accumulation becomes greater and greater till at last the animal succumbs and drops dead on the track—suffocated in the gas created by over-exertion. It is poisoned just as truly and as effectually as if it had taken a dose of the most deadly drug known to the chemist, or had breathed marsh gas or carburetted hydrogen gas.

While we must commend the article as a whole, leveled as it is, at a grave and unnecessary cruelty, we can but smile at the ponderous editorial cerebratim that emitted the above physiological doctrines.

THE BACTERIA DESTROYING SUBSTANCE OF THE BLOOD.

In a preliminary communication M. OGATA, of the Hygienic Institute of Tokio (*Centralblatt für Bakteriologie und Parasitenkunde*, May, 1891), refers to some of his earlier researches upon the effect of the blood of certain species upon the bacillus of anthrax and mouse septicæmia. At that time he was unable to say what substance was contained in the blood of these animals which conferred the special power over these particular bacteria. For some time he has been experimenting with reference to this subject, and he is at last able to announce that he has discovered in dog's blood a substance that confers immunity.

This substance is obtained by a chemical process similar to that employed for precipitating complex proteids, and is called a "ferment" by the writer. We give his conclusions:

The substance is readily soluble in water and glycerine, but not in ether or alcohol, though the latter do not destroy its action. Its power is not affected by weak alkalies, but is by carbolic and hydrochloric acid. Its properties are destroyed by the digestive juices, and by heating to 45° C. The substance has decided "immunizing" as well as disinfecting properties, that are retained for a long time in a glycerine extract. It does not convert fibrin into peptone, nor starches into sugar.

EDITORIAL NOTES AND ITEMS.

A UNIQUE CASE.—We extract the following from the last issue of the *British Medical Journal*: "A nice point of law has lately been debated before a French court. The question was whether an operation on a dead body by an unqualified person came within the meaning of the enactment forbidding the illegal practice of medicine. It appears that a pregnant woman had just died, the cause of death not being stated. The curé of the village, who had been with her in her last moments, induced a neighbor who was in the room to perform Cæsarean section on the corpse with a view of saving the child. The operation was successful, but the operator was brought before the magistrate and fined 15 francs for having been guilty of illegal practice of medicine."

ANOTHER CASE OF HYPERPYREXIA.—In this *Journal* of date March 21st, 1891, appeared the report of a case of hyperpyrexia by Dr. Galbraith, of Omaha, Neb., and now we learn of another case equally quite as unaccountable, and which was reported at the May meeting of the Memphis Medical Society by Drs. Jones and Sale. The patient was a girl fourteen years of age, of bright and happy disposition, of good family, and "thoroughly trustworthy." There does not seem to be any chance or object for deception, the readings being taken in full sight and with the clothing removed. The mouth, axilla and rectum were the parts tested by numerous thermometers, and a considerable number of observations were made. No less than eight thermome-

ters were broken because not admitting of a sufficient expansion of the mercurial column. An instrument was ordered which would register as high as 150° F. Observations with this thermometer showed normal, then 115°, subsequently 135°, and still later 150°. After this it was placed in the axilla, when the expanding mercury destroyed the instrument. The rise in temperature is of but short duration. Altogether the case is striking, and does not at present admit of an easy solution.

THE ASSOCIATION OF GERMAN ALIENISTS will meet at Weimar on September 18 and 19. Among the questions to be discussed are the following: "Prophylaxis of Tuberculosis in Lunatic Asylums," "Responsibility and Criminality," "Drunkenness in Relation to Responsibility," "The Present Condition of the Aphasia Question," "Care of Epileptics," "Employment of Hypnosis in Lunatic Asylums."

JEWISH IMMUNITY TO CANCER DENIED.—B. W. Richardson (Asclepiad) denies the statement recently put forth of an almost, if not total, immunity of the Jewish race from cancerous affections. This observer has had no inconsiderable number of cancerous cases in Jews under his care, and found no noteworthy difference in the occurrence of the disease. Tuberculosis, however, he maintains is, according to his observations, much less prevalent in Jews than in Christians.

ENGLISH ESTEEM FOR AN AMERICAN PHYSICIAN.—Very outspoken expressions of esteem are observed in the English medical press regarding the late Dr. Fordyce Barker. Dr. Barker frequently visited upon the other side of the Atlantic, and always had an earnest welcome in the conferences of the first medical bodies in England. His worth was fully appreciated, and his nobleness and geniality recognized.

SENN'S METHOD OF INTESTINAL ANASTOMOSIS.—At the Surgical Clinic of Tuesday, June 23rd, at Rush Medical College, the spectators had the first opportunity during Prof. Senn's present incumbency of observing the operation for the production of an intestinal anastomosis between the lower part of the ileum and the transverse section of the colon, thus severing from the fecal circulation the ileo-cæcal portion of the gut. The operation was done for the relief of malignant disease involving the head of the colon.

Senn's method, by means of the longitudinal incision and the employment of the decalcified bone plates, was used. The operation, together with Parker's exploration of the post-cæcal region, and all of which was conducted by easy stages, required about one hour and twenty minutes, and was highly interesting throughout.

SOCIETY PROCEEDINGS.

Pennsylvania State Medical Society.

Forty-first Annual Session.

The society met at Reading, June 2d to 5th, there being over 300 delegates present from all parts of the state. The annual address by DR. ALEX. CRAIG, the president, was devoted to the consideration of the changes which have occurred since the organization of this body at the same place in 1849. At the present session, the incorporation having been accomplished, it now met as an incorporated body. The delegates in many instances came in stage coaches and numbered from nine counties. He alluded to the recent failure of the effort to obtain from the State Legislature a law to create a Board of Medical Examiners. All others are protected by law except the doctors.

Over 2,000 copies of the Transactions are distributed yearly, the cost being defrayed by an assessment upon each county society. A committee was appointed to aid the committee on the Rush monument of the American Medical Association, of one from each county.

The address in medicine by DR. J. C. LANGE, of Pittsburgh, was devoted to

THERAPEUSIS: NEW REMEDIES AND THEIR USE BY THE PROFESSION.

He alluded to the present method of forcing the many proprietary remedies upon the market, the obtaining of certificates and the ethical question connected therewith. The delusions of condurango, chian turpentine, kairine, the antipyretics, etc. The latest, called by an unscientific name, capitalized with thousands of dollars, is alleged to be fraudulent and to consist of an amelide and bicarb. of soda. Yet the medical journals are liberally supplied with commendations of it as an analgesic, antipyretic and anodyne. Indeed, a professor of therapeutics, during the last winter, dwelt upon it in his lectures in such a manner that students were in doubt, so wide was its usefulness, as to which deserved first rank, this or opium. Nothing succeeds like success, hence the advertiser invites us to call at his works and supplies us with knives, blotters, etc. He alluded to the value of the certificates printed, etc.

DR. A. B. BRUMBAUGH, of Huntingdon, delivered the

ADDRESS IN HYGIENE,

which forcibly depicted the errors so constantly found in homes, etc., in the sanitary surroundings, leading to diphtheria, typhoid, etc.

A paper by DR. BATTEN, Pittsburgh, on

TAPE WORM,

was devoted to that form originating from the use of raw or poorly-cooked beef, this being the form most frequently encountered. His treatment was the use of the oil of turpentine, tablespoonful doses, after a light meal. In one case he ordered fasting for a week and the use of vinegar in quantities as much as could be drank. Another took the pumpkin seeds with turpentine, fasting. In each the worm was expelled and a cure followed. He then alluded to the use of kameela, and male fern, chloroform, cocoanut, etc., regarding these equally good, sometimes requiring a variation, according to results. A spirited discussion followed, showing the tænicides to be much less limited than had been believed.

A very interesting paper by DR. CLEAVER was entitled

THE HISTORY OF THE MEDICAL PROFESSION IN BERKS COUNTY.

The report of the Legislative Committee gave some idea of the intricate mazes to be threaded by those who endeavor to obtain legislation for the benefit of the profession, the bill having passed after numerous amendments in the upper house, only to be killed by the efforts of the irregulars and others who pretended to oppose "class legislation." In spite of this the society determined to persevere, and the committee was continued this year, the legislature not meeting till 1893, to work up the profession throughout the state, so that in the next effort the support would be more earnest and beneficial.

DR. J. M. ANDREWS read a paper on

SUBACUTE PLEURITIS.

He believed that a single full dose of antifebrin would abort some cases. In a cachectic case, digitalis is useful. Quinine is of great value. Effusion occurring, what is to be done? We must limit or arrest the effusion, and when present, remove it. Combat the inflammation, rub in iodine freely on the chest, eschew blisters, poultices, and the like, as they increase the amount of fluid. Absorption may occur unless the proportion of leucocytes is great. Arterial sedatives are injurious. So with antipyretics after the effusion. Quinine is of great value; 2 grains every three hours, till the temperature falls. The removal of the effusions important. Diaphoretics are objectionable, they depress too much, especially jaborandi. Iodide of iron is

the best remedy to promise absorption, 10 drops with 5 grains of iodide of potash every four hours. Under this in twenty cases, aspiration was needed only in four. How long shall we wait? Don't delay more than one week. That is from the time the temperature has reached normal. In paracentesis draw off half a pint, repeat every second day till absorption has rightly commenced. This allows the compressed lung to expand gradually. It obviates the dangers of congestion, œdema, albuminoid, expectoration, cyanosis, etc. During convalescence, assist the expansion of the lung, improve general health. Change of air, tonics, as from oxygen and good diet. Deep inspirations to aid the complete restoration of the lung, exercise and light gymnastics follow, and if needed strychnia, electricity, etc.

DR. W. F. WAUGH, of Philadelphia, read a paper on the

TREATMENT OF TYPHOID FEVER WITH THE
SULPHO-CARBOLATE OF ZINC,

claiming most excellent results from the history of many cases.

DR. HIRAM CORSON, of Norristown, Pres. of this society in 1852, had a resolution passed urging the appointment of a woman on the Board of Public Charities. A committee was appointed to urge this upon the Governor of the State.

Wednesday afternoon was devoted to consumption. DR. T. J. MAYS, of Philadelphia, read a paper the *Contagion, Theory and Treatment*, and DR. HUGH HAMILTON, of Harrisburg, on the *Physiological Behavior of Koch's Remedy*. Papers in discussion were read by Drs. C. W. Dulles, of Philadelphia, W. T. Bishop, of Harrisburg, L. H. Taylor, of Wilkesbarre, and others. The argument seemed rather opposed to the benefit of Koch's lymph and the contagion theory.

DR. FLICK, of Philadelphia, insisted strongly that certain houses became centres of this disease, and quoted his former paper on the 5th ward of Philadelphia, which he had so thoroughly investigated. Much interest was shown by the entire body in this discussion.

DR. O. H. ALLIS, of Philadelphia, read the

ADDRESS ON SURGERY,

giving problems in surgery in a conversational way. He spoke of the impropriety of Choparts, Pirogoffs, of similar operations as rendering the leg nothing but a peg leg, not useful for running, or the employment of an artificial leg, in short he insisted that in all such cases amputation should be below the knee so that a leg might be applied on which the patient could walk, run, in short being equal to the real leg. He suggested the idea of endeavoring to unite the ends of divided arteries, perhaps the insertion of a joint when the joint anywhere was destroyed, the cutting out of a portion of bone to permit the sutur-

ing of nerves, where otherwise the union could not be obtained, the resection of the fibula when false joint of the tibia occurred, illustrating his address by excellent diagrams and calling down the house, when he had concluded, by his masterly and convincing way of talking. The surgeons present attacked some of his views, but all admired them.

DR. PRICE, of Philadelphia, illustrated his coincidence as to the amputation below the knee by quoting and exhibiting his own case; he had an amputation just below the knee, and rode, mounting from either side, walked many miles on gunning trips, and emphatically declared that he would prosecute any one who would amputate his leg so as to leave a stump not suitable for an artificial leg. One objected that Chopart or Pirogoff operation was better for a poor man not able to buy an artificial leg and yet could shovel earth, etc., with a stump left as long as possible. Several railroad surgeons participated in this animated discussion and quoted their results in that kind of work.

DR. E. E. MONTGOMERY, of Philadelphia, read a paper on the

CONDITIONS FOLLOWING PARTURITION REQUIRING ABDOMINAL SECTION.

Formerly patients were permitted to die with large collections of pus in the abdomen. These could have been washed out and life saved. Now we know the value of vaginal and intra-uterine antiseptic washing. The curette has become of great importance to remove decomposing material, and then irrigate to render the cavity sterile. Mortality is thus greatly reduced, but when the disease has extended beyond the uterine mucous surface, peritonitis, metritis, salpingitis or ovaritis follow. Here abdominal section is imperative. We find often small ovarian tumors, these may be bruised or ruptured in parturition. Section enables their removal, irrigation, asepsis and safety.

Tubal disease, pus collections in the tubes, are reported, large fibroids; each aids to develop sepsis and death. Retention of the placenta, in part or clots, will produce sepsis. He related many cases to prove how readily the operation could be done, and its sure value.

In abscess of the uterine walls, he prefers extirpation of the uterus. He did not urge the section in every case of sepsis; he would first determine with great care the avenue of the poison to enter the system—as in a case, where there was abdominal sensitiveness, after a very difficult labor, temperature 103°, ether was given, and search revealed a laceration through the peritoneum into the rectal septum. A profuse, extensive lochia was discharged. The tear extended to the ischial tuberosities, and on the left into the broad ligament. No incision here was deemed

necessary, the sutures were removed, thorough irrigation performed, and the wound treated as an open one. Temperature subsided, but the next day rose to 106° , when she was placed on a blanket, wrapped in a sheet wrung out of ice-water, bathed in ice-water, given 10 grs. of acetanilide hourly for three doses, followed by rapid convalescence.

In sepsis he urged careful examination as to the avenue, and its elimination.

If no vaginal or vulvar laceration, dilatation of the uterus, curetting the cavity, and irrigation.

Accumulation in the pelvis, etc., the prompt opening of the cavity, removal of diseased organs, irrigation and drainage.

Where no cause is found in the pelvis, curetting, etc., have no influence. An exploratory incision will determine whether small pus collections in the organs serve as centres of poison. Even puncture the ovaries, as it, with the anti-septic knife, will not harm. Remove the uterus where its walls are abscessed. Remove promptly fibroids in the uterine walls. If there has been reason to suspect the presence of small dermoid or other ovarian cysts, and their injury in parturition, section is indicated urgently.

Drs. J. M. Duff, Pittsburg; M. Price, Philadelphia; John C. DaCosta, Philadelphia, and others, differed greatly, some counseling prompt action, others showing a conservative spirit, and detailing cases where good results followed, even in apparently desperate conditions, though section had not been practiced.

The next paper was by DR. EDW. JACKSON, Philadelphia,

WHAT TO DO IN INCIPIENT CATARACT,

taking the ground of operating when the opacity had become such that vision was obscured, and showing instances where delay had not proved objectionable, as well as the regular treatment which he had found of benefit in the early stages.

DR. J. A. LIPPINCOTT, Pittsburg, read the Address in Ophthalmology, dwelling on contagious ophthalmia as so often seen in orphan homes, etc., and the danger of the indiscriminate use of towels, etc. A Committee on Contagious Ophthalmia was afterwards appointed, with Dr. Lippincott as chairman.

Some time was devoted to the amendment of the By-laws, as in the articles of incorporation certain points had not been considered, and after this session it required all changes to lie over for one year.

The Address on Obstetrics was by DR. J. M. DUFF, Pittsburg, who reviewed the year's work in this department.

Asepsis, although so important, was still ridiculed by some, or performed in a careless way, with bad results. A 2 per cent. solution of creoline seems to have preference, in intra-uterine

uses, or a 3 per cent. of lysol, while many laud the use of benzine as a safe and powerful germicide. The sulphate of copper in 1 per cent. solution is quoted as not being followed by a single case of septicæmia. No poisoning or bad results were seen. Roberts thinks it aids involution. Peroxide of hydrogen in a few cases has led to its being highly prized. The immediate repair of lacerations is aseptic, and prevents later troubles.

The imperforate dressing of Garrigues is indispensable.

Menstruating nurses are not necessarily dangerous, unless wanting in cleanliness. A putrifying funis may infect both mother and child.

Puerperal fever, owing to asepsis, is much decreased.

Septicæmia is now puerperal infection. Sapræmia affections are amenable to treatment, are caused by the alkaloids of putrefaction from retained placenta and clots. Septicæmia diseases are virulent, produced by direct absorption, probably from ptomaines. Curetting the womb is urged and devoid of danger. In suppurative peritonitis, abdominal incision and immediate washing out and drainage. In severe flatulence, the trocar is recommended.

Eclampsia: Albuminuria is a causative—eliminate and give chloroform, 10 to 20 drops in water before meals. Urine will increase and albumen diminish. The wet pack is a prophylactic. Veratrum, hypodermically, acts well.

Placenta prævia is diagnosed by palpation. Untoward symptoms require prompt delivery by Braxton Hicks' method.

Post-partum hæmorrhage is treated by tampon of iodoform gauze, and hydrastin and hypodermic injections of caffein in benzoate of soda. Kochs inverts the uterus, puts an india-rubber band around the neck of inverted part, a few hours after removes the band, reduces the inversion, gives ergot and kneads.

Rupture of uterus requires laparotomy.

Ectopic pregnancy is more frequent, once in 500 pregnancies. Electricity, removal as soon as known, are each advocated by good authority.

In abortion nothing new is said.

Electrolysis, cellulitis, contracted pelvis, were each treated.

Fluid extract of galactaga was highly vaunted as a galactagogue, and antipyrin as in opposition.

Mammary abscess is not always to follow cracked nipples.

The whole paper teemed with matters of interest, and was enriched with a full bibliography.

DR. S. SOLIS-COHEN addressed the Society on "Patent Medicines and the Newspapers."

DR. C. R. EARLEY, Ridgway, spoke on "Catarrh," and gave an interesting account of the medication, etc., of the olden time.

DR. J. AULDE, Philadelphia, spoke on the "Therapeutics of Euphorbia Pilulifera."

The Society closed this, one of its most interesting and successful sessions, on Friday, by the selection of the following officers: President—Dr. S. L. Kurtz, Reading; Vice-Presidents—Dr. J. B. Roberts, Philadelphia; Dr. H. G. McCormick, Williamsport; Dr. H. H. Whitcomb, Norristown; and Dr. I. C. Gable, York; Secretary—Dr. Wm. B. Atkinson, Philadelphia; Assistant, Dr. C. W. Dulles, Philadelphia; Treasurer—Dr. G. B. Dunmire, Philadelphia, and Censors for the thirteen districts and delegates to the American Medical Association, etc. Next place of meeting, Harrisburg, third Tuesday in May, 1892.

The Address in Medicine for 1892, Dr. J. H. Musser, Philadelphia; in Surgery, Dr. T. D. Davis, Pittsburg; in Obstetrics, Dr. H. G. McCormick, Williamsport; in Mental Disorders, Dr. J. W. Phillips, Clifton; in Hygiene, Dr. A. A. Woods, Erie; in Otology, Dr. G. R. Rohrer, Lancaster.

Drs. C. G. Loose, W. T. Bishop and T. M. Livingston were appointed a delegation to the State Pharmaceutical Association.

Philadelphia County Medical Society.

Stated Meeting May 29, 1891.

THE PRESIDENT, JOHN B. ROBERTS, M.D., IN THE CHAIR.

DR. FRANK WOODBURY submitted a paper on NITROGEN-CONTAINING FOODS AND THEIR RELATIONS TO MORBID STATES.

In connection with the paper of the evening, by Professor Chittenden, upon the "Food-value of Beef-preparations," I have been invited by the Honorable Board of Directors to contribute a few remarks upon "Nitrogen-Containing Foods and their Relations to Certain Morbid States." Under the circumstances, it is proper that what I have to say shall be made as brief as possible.

At the outset, our attention is drawn to some fundamental physiological facts which must be kept in mind during the discussion of this subject. The human body is now regarded as a unit composed of an aggregation or community of cells. These anatomical elements differ from each other in some respects, but agree in this: each cell consists of two parts, one living and one non-living, corresponding with cell-nucleus and formed material. What is visible to us is the non-living part, or the formed material; the real living part of the organism is hidden from view. Just as in vegetable tissue, the parts that are permanent and solid are composed of the cell-walls, which may remain long after the essential living part or protoplasm of the wood-cell has dried up and disappeared—in a similar way, in

the human subject, the various organs and tissues which give it form and substance are not living; the only part exhibiting vital phenomena is the soft, shapeless, and colorless cell-nucleus, consisting of protoplasm or bioplasm. This living substance, in its chemical composition, resembles the various tissues, varying somewhat according to function, but it contains one essential ingredient which is so characteristic as to confer its name upon the whole class—this element is nitrogen. The celebrated dictum, "Without phosphorus, no thought," might be paraphrased "Without nitrogen, no life." Viewed from the physiological standpoint, the name "Azote," applied to this element by Lavoisier, appears remarkably inappropriate.

As a necessary constituent of the tissues, therefore, nitrogen, in a state of combination, is always present in the human body. Since it is found in considerable quantity and in various forms in the excretions, some two or three hundred grains being discharged daily by the kidneys alone, besides what is lost by the intestinal tract and the skin, it is evident that in order to maintain life the supply must be kept up from outside sources. There are two principal directions in which we may look for the supply of nitrogen, 1, the atmospheric air, and 2, the food.

Although the atmospheric air contains about 80 per cent. of nitrogen, we may dismiss this at once as not available, beyond a very limited extent. Experiment has shown that it is not consumed or absorbed in the act of respiration; but a certain amount of air is always swallowed with the food and passes into the stomach, where it may become absorbed by the gastro-intestinal mucous membrane. It is possible that a small quantity is introduced by this channel, especially since it has been demonstrated that a moderate amount of gaseous nitrogen is excreted or exhaled by the skin.

Nitrogen-containing food must, therefore, be regarded as practically the only source of the constant supply of nitrogen which is so essential to the maintenance of the body in a normal condition. In fact, due attention has already been given to this by Liebig, Fick, Wislicenus, Parkes, Pavy, Flint, and others; and the proper relation of the two great divisions of proximate principles of organic origin, the nitrogenized and the non-nitrogenized, have been pretty closely determined. As their results are to be found in all the text-books, I will not refer to them in detail. I may remark, however, in passing, that from the clinical standpoint there appears to be a fallacy underlying all these calculations of dietaries, where food values are expressed in grains of nitrogen and carbon, inasmuch as no allowance is made for waste; the entire quantity ingested is supposed to be digested and assimilated. In

practice we know that the feces contain considerable nitrogen, which is not excretory, properly speaking, but represents the excess of consumption, part of the food having escaped digestion. In nursing infants the feces consist largely of undigested casein. Even adults are not able to entirely digest milk, and if so simple an article of food as milk is not completely assimilated, what warrant have we for assuming that the nitrogenized constituents of peas and beans, or of animal tissue, will yield their full equivalent of potential force to the organism? On the contrary, we know it to be a fact, that much food-stuff passes through the alimentary canal without having its proximate principles extracted by the digestive organs and the absorbents.

We may, however, both clinically and by physiological experiment, making due allowance for personal equation, determine with sufficient exactness the kinds and proportion of different foods required to maintain the body in a normal condition. Proceeding on the same lines, we may discover the effects of an excess, actual or relative, of nitrogen; or, on the other hand, we may ascertain the results of deprivation, either partial or complete. We may also be able to see some therapeutic applications of the knowledge thus gained.

From the time of Hippocrates, and even earlier, it has been known that health and disease are largely influenced by food, and the effects of an animal diet are different from those of a diet exclusively of vegetables. A distinction was even made between leguminous and other forms of vegetable food. It was not until our day, however that the practicing physician possessed sufficient knowledge of the chemistry of food and of metabolism in health and disease to enable him to direct the diet of his patients upon scientific principles. Following the definition given by Hippocrates: "Medicine consists in addition and subtraction, the addition of the things which are deficient and the subtraction of those things which are redundant; he who practices this is the best physician, but he whose practice is farthest from it is the farthest removed from a knowledge of the art"—we can now prescribe viands suited to a deficiency of nitrogen in the system, or substitute others if there is an excess. To the therapeutic aspect of the subject I will now very briefly ask your attention.

Taking up the latter instance first, we find that a diet poor in nitrogen is useful in several forms of rheumatism, in gout and in lithæmia, and also in recurring attacks of biliousness and bilious headache. Scurvy appears to be caused by an absolute, as well as a relative, excess of nitrogen in the food, and I have seen it caused by the use of an excessive amount of fresh meat among children in an orphan asylum. In its treatment, vegetable food relatively poor in nitrogen is usu-

ally employed. Some skin diseases, possibly of lithæmic character, are only to be cured by withholding nitrogenized food. It seems possible that a liberal use of meat in the diet may have some connection with the development of cancer, a disease which appears to be on the increase, as was pointed out by Dr. R. A. Cleemann, of this Society, in his "Address on Hygiene," delivered before the Medical Society of the State of Pennsylvania a few years ago. Dr. W. Mattieu Williams, in a little work on the "Chemistry of Cookery," pointedly directs attention to the large consumption of meat as a cause of various forms of cancer. In families where a hereditary tendency of this kind exists, it is possible that it might be overcome by vegetarianism. Some nervous affections, notably epilepsy and chorea, are greatly benefited by abstention from meat in the food.

Owing to the writings of Roberts, Fothergill, and others, a causative connection between a diet rich in nitrogen and some forms of kidney inflammation or degeneration is now generally recognized. And in the treatment of the various forms of Bright's disease, attention to the diet is generally admitted to be of prime importance. There is a widely-spread opinion that nitrogenized food is favorable to the occurrence of inflammation, and for this there seems to be a scientific foundation. Parkes has shown that a non-nitrogenized diet causes lowered blood-pressure and diminished arterial tension. Meat, therefore, is ordinarily prohibited under the antiphlogistic treatment, as it was formerly called. In acute inflammations of mucous surfaces, especially in plethoric subjects, the use of animal food is usually forbidden. This should not be applied too strictly, however, for in some cases of sub-acute or chronic character, a generous and nourishing diet is necessary.

On the other hand, nitrogenized food may be prescribed where there is, from any cause, a deficiency of albuminous principles in the blood, for example, in anæmia or chlorosis. In phthisis, this condition is sometimes quite marked and good results have been obtained from the "beef and hot-water" plan of treatment, and also from the use of fresh bullock's blood, or hæmoglobin, which requires less digestive capacity and is more easily assimilated than muscle-tissue.

Children frequently suffer from a deficiency of nitrogen. Where an infant is reared upon condensed milk entirely, the limbs are plump but the tissues are flabby, on account of anæmia. Such children are late in getting their teeth, and have little power of resistance against disease. The addition of oat-meal, barley or rice to the milk will often bring about marked improvement and may prevent the development of rickets. Just here I might stop to point out the fallacious character of some of the arguments based upon the

comparative chemical composition of woman's milk and other foods. Leeds found in a number of specimens of woman's milk that the nitrogenous constituents varied from 4.86 to 0.85 per cent. So that one specimen of mother's milk may have six times the amount of albuminous material contained in another.¹ This shows the necessity when the child does not thrive at the breast, of examining the milk to find out if it be deficient in nitrogenized constituents. If so, the addition of beef, meal, bovine or other nitrogen-containing food in an easily-assimilable form is advisable.

Eczema in infants, or in sewing women, is often traceable to a deficiency of nitrogen in the food, and Dr. Rohé, of Baltimore, advises the addition of meat-broth and eggs to the diet as an essential part of the treatment. Similarly, in many syphilitic eruptions upon the skin, in broken-down subjects, good food is a necessary preliminary to any specific treatment. Neurasthenia and atonic dyspepsia, which are so often associated in the same patient, especially if he is at the same time anæmic, can only be relieved by nitrogenized and fatty food, administered in a form easy of assimilation and at comparatively short intervals. On the other hand, in diabetes and in obesity, the diet may be largely nitrogenous, but in this case it is because there is a desire to reduce the carbo-hydrates and not because an excess of nitrogen is particularly sought after.

To return to the children, I wish to call attention to the fact that during the period of growth and development, more nitrogen is needed than after the body has assumed its full stature. Hence, school-children should have a due allowance of meat, and should be encouraged to eat oat-meal, corn, beans, peas and other vegetables known to contain this valuable constituent.

In the foregoing brief *résumé* of an important and interesting subject, I have not made any distinction between the nitrogenous, proximate principles of animal and vegetable origin. Chemically and physiologically they are nearly identical; but practically there are minor differences of palatability, digestibility, and relative utility, which, at present, our limits will not permit us to consider.

SCIATICA.—At the clinic of Prof. Landon Carter Gray, of New York (*Practice*, Feb., 1891), much benefit has been obtained in sciatica from phenacetin, given in tablets of four to eight grs. every three or four hours. There are a good many cases, however, which do not respond to it very markedly. Doubtless, too, there are many cases of sciatic neuritis, rheumatism, gout, etc., in which a diagnosis of sciatica is erroneously made; but perhaps more frequently sciatica is mistaken for one of these affections.

FOREIGN CORRESPONDENCE.

LETTER FROM LONDON.

(FROM OUR OWN CORRESPONDENT.)

The London Student and his Degree—Defeat of the Senate of the University—Sir Walter Foster on Political Powerlessness of the Profession—Severe Hail and Influenza—Professor Gairdner's Little Story.

The London student is at length to have a degree on "reasonable terms," the present standard being—as every one knows—especially in preliminary scientific subjects, absurdly high. London enjoys the unique position of being the only metropolis in the whole civilized world that does not possess a teaching University. The Royal Commission of 1888, reported that the case for such a body had been made out. In fact, the want has been admitted on all hands, and a practical illustration of the evils of the present policy is ever-present in the steady exodus of London students to the provincial Universities. At length the Senate of the University, with the aid of the authorities of the Royal Colleges of the Physicians and the Surgeons so far threw off their slough of slumbering conservatism as to draw up a scheme for reconstitution. Defeat, however, has awaited their proposals on all hands. The provincial schools, which were practically ignored, at once raised the standard of revolt. The Council of the College of Surgeons had not consulted their members and fellows, who accordingly passed most adverse criticisms both upon the scheme and upon their Council on the first opportunity that offered itself. Lawson Tait, also, carried a resolution to the effect that the Society of Apothecaries ought not be excluded. The final blow was given at a meeting of the Convocation of the University, which threw out the proposals by an overwhelming majority. Nothing but a complete teaching scheme will satisfy the public and the profession. Some of the journals say in so many words that it is nothing but the instinct of self-preservation that has forced the London Senate to unbend so far as it has done. The spirit of reform, however, is abroad, and has invaded the precincts of these autocratic boards that have hitherto consulted no interests but their own, and have done their best to make close corporations of what should be national institutions.

One of the first men to call attention to the existence of such a thing as a democracy in the medical profession was Sir Walter Foster. In 1883 he made a famous speech as President of the Birmingham Branch of the Midland British Medical Association. In that address he pointed out the political powerlessness of the profession as a body, and thus started the wave of opinion that is now dashing against the outworks of various time-honored anachronisms. After twenty-three years service Sir Walter has just resigned his post as honorary physician to the Birmingham General Infirmary. Five years since he was elected direct representative on the General Medical Council, one of the greatest honors that could be conferred on a medical man in this country, and he is also a member of Parliament. On the occasion of his first entering public life he mentions that Sir Andrew

¹ Quoted by Starr in his "Hygiene of the Nursery," Philadelphia, 1888.

Clark wrote him a word of warning to the effect that "Medicine is a jealous mistress," to which he replied that the best antidote to jealousy was unbroken loyalty. Sir Walter added that in all his public life he never had, and he hoped he never should, lose sight of medicine, for he believed their profession was interwoven with the highest and best legislation and the future welfare of mankind. The latter appears to be very much the conclusion arrived at by most philosophical latter day thinkers, and may be otherwise expressed by saying that medicine is the most progressive, as it is the most comprehensive among the professions. After waiting all these centuries the outside world seems to be waking up to pretty much the same opinion. In England, it may be noted, public enthusiasm has not reached the length of making peers of the doctors; that honor, so far, is reserved for such people as soldiers, diplomats, bankers, brewers, and successful politicians. The claims of literature have long been conceded to be represented in the hereditary House. Medicine, however, has had only one representative, somewhere in the middle ages.

The severe winter is being followed by a late spring. Hail storms have been reported all over the country, varied with snow and sleet, and now and then a warm genial day is dovetailed into the midst of this backward season. The cold has had the effect of swelling the Registrar General's returns to a remarkable degree. In London alone there is an increase of 433 deaths above the average for the corresponding week in the last ten years. The deaths from diseases of the respiratory organs were 584, or 240 in excess of the average; of these 230 were attributed to pneumonia, 302 to bronchitis. Influenza reached the high figure of 148, or 21 in excess of the highest weekly number of deaths in the outbreak of 1890. The death rate of the Metropolis for last week has been 24 per 1000. In some of the provincial towns, moreover, the rate has been more than doubled. During the last three weeks, for instance, the following returns have been made from provincial towns; Sheffield, 57.8, 70.5, 59.3; Leeds, 27.9, 36.1, 48.3; Manchester, 29.8, 55.1, 43.6. A more intimate acquaintance with this mysterious disease brings the lesson that mortality is largely influenced by surrounding insanitary conditions. At the best of times Sheffield, which has suffered more than any other town in the present epidemic, is especially liable to affections of the respiratory organs. This is no doubt due to a great extent to its smoke-laden atmosphere and to the dusty workshops with which its staple hardware industries are necessarily associated.

The other day in Dublin, Prof. Gairdner revived a story that went the round in Edinburgh many years ago, and of which it may be said *Se non e vere, e ben trovato*. He asks whether it is better to test a harmless remedy by giving it all round, or to adopt the more scientific plan of giving it to one-half of our patients (reserving the other half as a control experiment). The story refers to the former method. "A lady, finding in her prescription something unwonted and, as she thought, uncanny, turned back to get a further explanation from the Professor, who by that time was fully occupied with someone else. But the man at the door was equal to the oc-

casione. Taking the prescription into his hand he ran over it with a practiced eye, inured even to Latin formulæ by long and faithful service in a medical man's house. He returned the paper to the lady and showed her to the door with the remark "Ou aye, mem, its a'richt, they're a' gettin' that, the now." The Professor had been experimenting all round, more or less, with some of the more unwonted salts, such as titanium, cadmium, tellurium, palladium and so on, most of which turned out to be tonics, with the exception of one, which had the awkward peculiarity of causing the patient to shed abroad such a peculiar and disagreeable perfume or stink (if you will pardon the word) that it had to be forthwith abandoned." As Dr. Gairdner remarks, the anecdote did not detract from the world-wide fame of the Professor in question, nor was it known to have emptied his crowded waiting rooms to any great extent. D. W.

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

With the June meeting the New York County Medical Association concluded its labors for the present season. After the scientific exercises, the members adjourned to the supper-room below, where they made merry on strawberries and ice-cream, served in place of the ordinary collation, and were entertained with short congratulatory speeches by the President, Dr. McLeod, and others. Among the speakers were Dr. Truax and ex-Presidents Harrison and Shrady, and the latter, in his genial way, related a number of reminiscences of medical life in New York in former days. The Association still continues in a very gratifying condition of prosperity, and, notwithstanding the fact that an unusually large number of its members have been removed by death during the past year, it adjourns for the summer with 648 names on its roll, as against 531 at the same time last year.

At this June meeting the first paper of the evening was by Dr. Edward Sanders, on "Chronic Induration following Pelvic Cellulitis in the Female, and its Treatment by Galvanism." His observations were based on no less than 200 cases personally treated by himself, and without going into the somewhat vexed question as to the part played by peritonitis in the production of the condition referred to, he made a careful analysis of the cases and presented a most valuable aggregation of facts as the result of his practical experience. In the vast majority of his cases, the pelvic induration found to be present was the result of parturition at term, or of abortion, and, after having tried various other methods of treatment, he had found that galvanism was by far the most efficient and satisfactory in every way. In fact, he said, he had yet to meet the first uncomplicated case of the kind, without any concomitant disease of the ovaries or tubes, that could not be entirely cured by this agent.

The more recent cases required but a comparatively short time for cure, but in those of long standing, it was necessary to keep up the treatment for a considerable

period. While the pain and other symptomatic features were often relieved after a few applications, the lesions did not disappear, as a rule, until the method had been employed for some months. Dr. Sanders is very particular as to the exact dosage and regulation of the galvanic current, always making use of the milliampère-meter and the rheostat. He never resorts to puncture, believing this practice to be dangerous, as well as unnecessary. For the comfort of the patient he regards it desirable to have an electrode of large surface for application on the abdomen, and he usually employs a modified Apostoli electrode for this purpose. For the intra-vaginal electrode he uses a metallic ball, and sometimes one of clay. It is seldom or never necessary to use an intra-uterine electrode, as this is not only less efficient, but also much more painful, as a rule, than the intra-vaginal electrode. In general, he thinks a current of from 100 to 125 milliampères, maintained for about five minutes at a sitting, and repeated about twice a week, is that which will be found most satisfactory; though in exceptional instances he has employed a current of the strength of 200 milliampères. The battery, a Wait and Bartlett, which he habitually uses in his office, has sixty cells; but he stated that one of forty cells would answer every purpose.

The second paper of the evening was by Dr. T. H. Manley, who took for his subject "Resection as a Substitute for Primary Amputation." In it he made the somewhat startling claim that, in civil life, a primary amputation is never a justifiable amputation; and it was devoted to a strong and carefully prepared plea for conservatism in surgery. The plan of treatment which he advised, he said, was based on modern experience and teaching, and it included, in the first place, efficient asepsis or antisepsis; and, in the second place, proper conservation of the tissues. It should be the surgeon's endeavor to preserve all that had not been actually destroyed, and the method involved a thorough knowledge of modern osteoplasty. If seen early, the parts could be kept in an aseptic condition; but if septic phenomena had already made their appearance, suitable antiseptic measures were called for. Bichloride of mercury was undoubtedly the most efficient antiseptic agent at our command, but care should be taken not to use it in too great strength; a solution of the strength of 1 to from 5,000 to 10,000 being the most satisfactory.

Antisepsis, he believed, had been used too much by surgeons. When a strong bichloride solution was employed, he had frequently found that a useless stump was the result, on account of the extreme sensitiveness of the parts. Moreover, he had frequently seen insidious osteomyelitis develop in the case of perfectly healthy subjects, where there was nothing to account for this untoward result but the use of powerful antiseptics. Hence, he said, he employed no antisepsis whatever if a septic process had already commenced; making use of nothing but sterilized water.

Resection, Dr. Manley contended, must not be confounded with restitution of structure, although very much could be accomplished by osteoplasty. In the shafts of bones, the great obstacle to success in treatment was medullary intolerance, and hence the fastening to-

gether of fragments by pegs and wiring was apt to be followed by osteomyelitis. The great reliance here, therefore, was to be placed on periosteal osteoplasty. In his concluding remarks he said that in his paper he claimed nothing new in principle; all that he claimed was a new application of principles already well established. In primary amputations it was well known that a second operation, involving the amputation of the limb at a higher point, was often called for. By delay, however, we did not put our patient's life in any additional danger; and if we succeeded in saving the limb, there was certainly a great gain, since a natural limb, even though it were only fairly useful, was unquestionably much better than any kind of an artificial one. Finally, there was the medico-legal aspect of the question to be taken into consideration. It was now generally understood by the laity, as well as the profession, that limbs could often be saved by the resources of modern surgery, which formerly would have been sacrificed, and therefore, any surgeon performing an amputation was liable to be summoned to answer to the charge of having removed a limb unnecessarily.

There were present as guests Dr. Wm. C. Wile, of Danbury, Conn., Editor of the *New England Medical Monthly*, and Dr. Quimby, of Jersey City, and both these surgeons spoke in warm approbation of Dr. Manley's conservative views.

Before adjourning the Association by a unanimous vote determined to send to the Judicial Council of the American Medical Association a memorial, prepared by a committee of which Dr. Robert Hinman was chairman, in reference to the eligibility as officers and delegates of the National Association, of physicians from the State of New York who are not in accord with the Code of Ethics of the Association.

This year the Commencement of the College of Physicians and Surgeons was held in connection with that of Columbia College, with which it has recently been consolidated as the Medical Department of the institution. There were 130 graduates in medicine, and in the course of his address the President, Mr. Low, spoke of the significance which this happily consummated union had for the cause of medical education in this country.

P. B. P.

ASSOCIATION NEWS.

Committees on Railroad Surgeons and Incorporation.

At the late meeting in Washington the President announced as the committee:

On Railroad Surgeons.—Ala., J. Cochran, Mobile; Ark., L. P. Gibson, Little Rock; Cal., G. G. Tyrrell, Sacramento; Col., John Elsner, Denver; Conn., T. D. Crothers, Hartford; D.C., J. Ford Thompson, Washington; Del., R. G. Ellegood, Concord; Fla., J. D. Fernandez, Jacksonville; Ga., T. S. Powell, Atlanta; Ill., B. M. Griffin, Springfield; Ind., J. F. Hibberd, Richmond; Iowa, G. F. Jenkins, Keokuk; Kans., W. L. Schenck, Osage City; Ky., J. M. McCormack, Bowling Green; La., T. G. Richardson, New Orleans; Maine, A. Garce-

lon, Lewiston; Maryland, G. Lane Taneyhill, Baltimore; Mass., A. L. Norris, Cambridge; Mich., J. E. Emerson, Detroit; Minn., Perry H. Millard, St. Paul; Miss., B. A. Duncan, West Point; Mo., G. W. Broome, St. Louis; N. C., Thos. F. Wood, Wilmington; N. H., G. P. Conn, Concord; N. J., D. Benjamin, Camden; N. Y., E. D. Ferguson, Troy; N. Dak., G. McIntyre, Hillsboro; Ohio, S. S. Thorn, Toledo; Oregon, C. C. Strong, Portland; Pa., John B. Roberts, Philadelphia; R. I., W. R. White, Providence; S. C., W. Peyre Porcher, Charleston; Tenn., T. J. Happel, Nashville; Texas, D. R. Wallace, Waco; Vt., D. C. Hawley, Burlington; Va., Bedford Brown, Alexandria; Wash., C. L. Flannigan, Olympia; W. Va., G. A. Aschmen, Wheeling; Wis., Jas. T. Reeve, Appleton.

On Incorporation.—R. Harvey Reed, Mansfield, Ohio; J. F. Hibberd, Richmond, Ind.; Irving A. Watson, Concord, N. H.; N. S. Davis, Chicago, Ill.; W. B. Atkinson, Philadelphia; W. T. Briggs, Nashville, Tenn.; W. K. Sheddon, Williamsport, Tenn.

TREASURER'S REPORT.

DR. RICHARD J. DUNGLISON, Treasurer, in account with the American Medical Association, for Fiscal Year to April 30, 1891, inclusive.	
Dr. 1890.	
May 24. To cash balance reported by Treasurer at Nashville meeting	\$4,483.53
May 24. To balance, office of publication, at end of fiscal year	666.93
May 24. To dues collected at Nashville meeting \$3,765.00, less exchange	3,758.00
To balance of unexpended appropriation for stenographers	25.00
1891.	
April 30. To dues collected to date	10,045.00
April 30. To amount received at office of publication of Journal to end of its fiscal year	14,464.04
	\$33,438.50
Cr. 1890.	
June 2. By cash paid Dr. R. J. Dunglison, Treasurer, expenses of travel, etc., postage, telegrams and expressage	125.85
June 4. By stamped envelopes	87.20
June 5. By Dr. W. W. Potter, Chairman Section of Obstetrics, etc., expenses	10.25
June 5. Dr. G. C. Savage, Chairman Finance Committee, Nashville meeting, rental and printing	273.60
June 5. To C. F. Pollak, Index Clerk	10.00
June 5. By dues refunded	15.00
July 20. By Ward & Barnitz, printing	10.50
July 20. By rental of P. O. box	3.00
July 20. By stamped envelopes, expressage, telegrams, stationery, postage	38.06
July 25. By Wm. F. Fell & Co., printing	8.00
July 25. By Wm. F. Fell & Co., printing for Permanent Secretary	18.00
July 25. By stamped envelopes	8.00
August 9. By Dr. J. H. Musser, Chairman Section of Practice, expenses	19.00
September 5. By stamped envelopes, stationery, postage, duty on book	52.30
October 24. By Wm. F. Fell & Co., printing for Permanent Secretary	8.50
October 30. By Ward & Barnitz, printing	8.25
November 15. To postage, stamped envelopes, stationery, collector's commissions, expressage	33.02
November 15. By rental of P. O. Box	3.00
November 15. By Dr. P. O. Hooper, President of Board, draft on Treasurer, for expenses of Trustees of Journal to meeting of Board at Washington	337.50
1891.	
January 19. By Ward & Barnitz, printing	7.50
January 19. By rental of P. O. box	3.00
April 16. By Wm. F. Fell & Co., printing for Permanent Secretary	21.75
April 25. By Dr. W. B. Atkinson, Permanent Secretary, postage, telegrams, stationery, expressage, travelling expenses to date	146.35
April 27. By cash City Trust, Safe Deposit and Surety Co., premium for bond of Treasurer, as per resolution of Board of Trustees	50.00
April 29. By postage, stamped envelopes, stationery, collector's commission	39.59
April 29. By Ward & Barnitz, printing	5.85
April 29. By rental of P. O. box	3.00
April 29. By Drexel & Co., collection expenses on drafts	111.70

April 29. By Farmers & Mechanics National Bank, exchange on checks deposited during fiscal year	24.15
April 30. By Ward & Barnitz, printing	13.00
April 30. By paid office of publication of Journal since last annual meeting	8,151.50
April 30. By expended by office of publication of Journal during its fiscal year	14,634.57
April 30. By balance in treasury	\$8,664.81
April 30. By balance in office of publication of Journal at end of its fiscal year	\$762.40 9,427.21
	\$33,438.50

WASHINGTON, May 5, 1891.
This certifies that we have examined the accounts and vouchers of R. J. Dunglison, Treasurer of the American Medical Association, and found the same properly vouched and accurately cast, and that the balance in the treasury is \$9,427.21.

ALONZO GARCELON,
JOHN V. SHOEMAKER,
D. E. NELSON,
Auditing Committee.

MISCELLANY.

CHANGE OF ADDRESS.—Prof. John B. Hamilton has removed from Washington, D. C., to the Sherman House, Chicago.

REMOVAL.—Dr. E. A. Waggoner from Carrollton, Mo., to Burlington, Iowa.

THE SECOND TRIENNIAL SESSION OF THE CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS.—*Circular No. 1*.—The Committee of Arrangements takes great pleasure in announcing to the members and invited guests that the arrangements are sufficiently advanced to assure the success of the Second Triennial Session of the Congress of American Physicians and Surgeons, which will be held in this city during the 22d, 23d, 24th, and 25th of September, 1891.

A number of distinguished physicians and surgeons from abroad have accepted the invitation to attend, among whom may be named Mr. Thomas Bryant, Mr. B. E. Broadhurst, Mr. A. E. Durham, Mr. Reginald Harrison, Surgeon General Sir W. E. McKennin, Mr. U. Pritchard, Mr. F. Treves, Sir William MacCormac, and Dr. James G. Glover and William M. Ord, of London, England; Drs. McCall Anderson and W. T. Gairdner, of Glasgow; Mr. E. H. Bennett and Professor Cunningham, of Dublin; Professor John Chiene and Dr. J. Battey Tuke, of Edinburgh; Professor H. Krause and Dr. F. Beeby, of Berlin; Professor Curschmann, of Leipzig; Professor Hoffa, of Wurzburg; Professor Kuhne, of Heidelberg; M. Emil Juval, M. E. Landolt, and Dr. Pozzi, of Paris; Dr. A. Musso, of Turin; Dr. Von Mozengeil, of Bonn; Dr. Lowenber, of Paris; and Dr. Rafail Lavista, of Mexico.

The sessions of the Congress will be held in the Main Hall of the Grand Army Building, 1412 and 1414 Pennsylvania Avenue, from 3 to 6 P.M., daily.

The President's Address will be delivered in the Lecture Hall of the National Museum, Wednesday, September 23, at 8 P.M., followed by the Reception of the President, from 9:30 till 12. Order of Executive Committee. The Army Medical Museum will be open the same evening.

The sessions of the Societies will be held according to

the programmes of each, respectively, in the places as follows :

American Surgical Association, Main Hall, Grand Army Building, 1412 and 1414 Pa. Ave.

Association of American Physicians, Hall No. 1, Grand Army Building, 1412 and 1414 Pa. Ave.

American Climatological Association, Hall No. 2, Grand Army Building, 141 and 1414 Pa. Ave.

American Gynecological Society, Lecture Hall, Columbian University, 15th and H Sts. N. W.

American Laryngological Association, Parlor A, Arlington Hotel.

American Neurological Association, Parlors 182 and 183, Arlington Hotel.

American Orthopædic Association, New Reception Room, Arlington Hotel.

American Otological Society, Ladies Parlor, No. 1, Arlington Hotel.

American Ophthalmological Society, Ladies Parlor, No. 2, Arlington Hotel.

American Physiological Society, Parlor 181, Arlington Hotel.

The officers of the American Dermatological Association and the American Association of Andrology and Syphilology have made their arrangements with the Shoreham for places of meeting.

Office of Registration, Parlors 1 and 2, Arlington Hotel. From this office the mail of members and guests will be distributed, and the city residence of each member or guest can be ascertained.

The Association of American Anatomists will meet in this city during the sessions of the Congress, and will occupy Hall No. 3, Grand Army Building. The American Pediatric Society will meet here September 23, and 24, in the Lecture Hall of Columbian University, 15th and H Streets, N. W.

The Congress will be composed of the members of the societies and invited guests.

A registration fee of five dollars will be required of every member of the constituent societies who may register; invited guests will not pay the fee. Order of Executive Committee.

Participating societies can "accredit visitors to the Congress, who shall pay the registration fee, but shall not be privileged to participate in the deliberations of the Congress." Order of executive Committee.

A copy of the transaction of the Congress will be sent to each person who may register.

Only those who may register, invited guests, and ladies accompanying them, will be admitted to the Reception of the President.

Secretaries of constituent societies are requested to supply this Committee with the names and addresses of "accredited visitors."

The evenings of Tuesday, September 22, and Thursday, September 24, are left to the societies.

Members of the American Surgical Association and of the Association of American Physicians will conjointly entertain their foreign guests at dinner at the Arlington Hotel, Thursday, September 24, at 8 P.M.

The American Gynecological Society has also arranged

for a dinner at the Arlington Hotel, Thursday evening, September 24. The American Paediatric Society give a dinner September 24.

Other societies that intend to entertain their foreign guests are requested to communicate with this Committee.

Arrangements are in progress to secure reduction of railway fares. As soon as completed, the information will be communicated to each member and "accredited visitor."

The Arlington Hotel offers accommodations at the rate of \$4 per day, and the Hotel Arno offers rates "on the American plan at \$3 and \$4 per day, on the European plan, \$1 each per day. Exclusive use of bath, \$1 extra."

A blank certificate of registration will be sent to each member and "accredited visitor." The Committee requests each person receiving such certificate to fill the blanks and return it, with the fee, to Dr. John S. Billings, Treasurer of the Congress.

The American Pomological Society, and perhaps other societies, will meet in this city September 22-25. The Committee therefore suggest to the members an early arrangement for hotel accommodations.

Inquiries relating to railway fares must be addressed to Dr. S. S. Adams, 1632 K Street.

A complete roster of membership of the Congress has been prepared, with post-office address and society to which each member belongs.

The Committee will take pleasure in answering any inquiry relating to the local arrangements of the Congress.

SAMUEL C. BUSEY, M.D., *Chairman*.
1545 I Street N. W.

John S. Billings, M.D., Army Medical Museum; W. W. Johnston, M.D., 1603 K. St. N. W., Washington, D. C.; R. T. Edes, M.D., 1214 18th St. N. W., Washington, D. C.; S. O. Richey, M.D., 732 17th St. N. W., Washington, D. C.; J. Taber Johnson, M.D., 1728 K St. N. W., Washington, D. C.; D. Forest Willard, M.D., 1818 Chestnut St., Philadelphia, Pa.; I. E. Atkinson, M.D., 605 Cathedral St., Baltimore, Md.; C. F. Bevan, M.D., 807 Cathedral St., Baltimore, Md.; Samuel Johnson, M.D., 204 Monument St., Baltimore, Md.; Samuel Theobald, M.D., 304 Monument St., Baltimore, Md.; H. Newell Martin, M.D., Johns Hopkins Hospital, Baltimore, Md.

Washington, D. C., June 24, 1891.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from June 20, 1891, to June 26, 1891.

Major Julius K. Patzki, Surgeon, leave of absence on surgeon's certificate of disability, granted in S. O. 99, May 1, 1891, from this office, is extended two months on surgeon's certificate of disability. By direction of the Acting Secretary of War. Par. 15, S. O. 142, A. G. O., June 22, 1891.

Capt. William C. Borden, Asst. Surgeon, will, upon the final abandonment of Ft. Davis, Texas, report in person to the commanding officer, Jackson Bks., La., for duty at that post. By direction of the Secretary of War. Par. 4, S. O. 139, A. G. O., June 18, 1891.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending June 27, 1891.

Surgeon J. H. Hall, from Naval Station, New London, and to Naval Hospital, Chelsea, Mass.

P. A. Surgeon L. W. Atlee, from nautical school ship "Saratoga," and wait orders.

P. A. Surgeon J. M. Steele, ordered to nautical school ship "Saratoga."

Asst. Surgeon G. A. Lung, ordered to Naval Station, New London, Conn.

Asst. Surgeon J. E. Page, from Naval Hospital, Mare Island, and to the "Independence."

Asst. Surgeon M. R. Pigott, from U. S. receiving ship "Independence," and to Naval Hospital, Mare Island, Cal.

Asst. Surgeon J. G. Field, detached from U. S. S. "Omaha," and granted three months' leave of absence.

Frederick Gratton Brathwaite, of Stamford, Conn., commissioner an Asst. Surgeon in the Navy June 22, 1891.

The Journal of the American Medical Association

VOL. XVII.

CHICAGO, JULY 11, 1891.

No. 2.

ADDRESSES.

PRESIDENT'S ADDRESS.

Before the Annual Session of the State Medical Society of Connecticut, June 8, 1891.

BY M. STORRS, M.D.,
OF HARTFORD, CONN.

Gentlemen of the Connecticut Medical Society and Honored Delegates: I congratulate you on this, the ninety-ninth convention of the Connecticut Medical Society.

The year which has brought us to this epoch in the history of this society has been one of remarkable interest and activity in medicine throughout the world. Other years may have seen as much of substantial progress, but the year now ending has been marked by greater enthusiasm and has never been surpassed in close and critical investigation. Medicine has been so brilliant in its possibilities, so inspiring in its hopes, that it has caught the eye of a sympathetic world that has hourly and eagerly watched for the tidings, heralded from the laboratory and the clinic.

The year was ushered in by a strange pandemic disease, going over the continents and crossing the seas with the swiftness of light. It challenged etiological recognition. It eluded the scrutiny of the myriad of lenses focused upon it. It demonstrated to the biologist that there are causes of disease more subtle and imponderable than the microbe.

The unprecedented gathering of physicians at the international congress at Berlin was a prominent event of the year, both in itself and because it became in the public mind linked with the great discovery of Koch. For a time a feeling of disappointment clouds the public mind, and clinical and preventive medicine must have a patient waiting. But sympathy is with the discoverer, and the hope still abides that many now incurable forms of disease will be prevented or ameliorated. Subjects generic, but in a certain sense subsidiary to the great discovery announced by Koch, the contagiousness of phthisis, the relation of bovine to human tuberculosis have been warmly discussed. Tremendous interest attaches to every feature of that disease that carries off one-ninth of the human family.

The anti-vaccine war has been carried on in England with more zeal than ever. Edgar Crookshanks, of London, authority on bacteriology, has published his views, being similar to those of Creighton in the *Encyclopædia Britannica*. The contest has been carried to Parliament and several reports have been made. But Jenner is not dethroned.

But we must close the retrospect of the year. Standing here under the lengthening shadows of the closing century of our history we had it in our minds to take some theme appropriate to its departure. But we turn aside from this, as well as from all the exciting themes of the day, and ask you to consider the

HEALTH OF THE SCHOOLS.

The health of the schools is a difficult matter to determine, as many conditional factors enter into the calculation. Probably no one, if asked the question as to the actual sickness or physical or mental impairment in the schools of this state, could give any answer approximative of the amount. And yet there are men who are well posted in health matters who can tell just how many have died in the State and of what and where they died, the difference being that those to whom we refer have a plan and method of getting the information they desire through their regular system of reports, while those having charge of the schools have no systematic health inspection or supervision, and hence scanty or imperfect records. If we consult the district or school register it gives the attendance and non-attendance, but does not indicate in regard to the latter class whether they were absent from sickness or otherwise.

Parents know something about their children. They have occasion to speak of their ailments, of their pale appearance and languid condition, headache, loss of sleep and appetite. But they have made no satisfactory investigation, and know very little about the school-house or methods of study.

The board of school visitors who have supervision of the schools and, as local officers, come very near to the scholars, rarely make an inspection in the direction of health unless some epi-

demic is prevailing, nor do they make any special record or report of their inspection.

From the school board we go to the State Board of Education, the general headquarters of the schools. The items of interest from every district are at last supposed to center here and are tabulated even to the planting of a tree, blanks having been sent out to be returned with all the specified details. Here may be the place to find the facts of disease if any have existed. But in all the reports of the State Board for the last twenty-five years we scarcely remember to have seen, with one or two exceptions, anything especially relating to the health of the schools. Great irregularity of attendance is reported from many of the towns and much deplored, but nothing to show how much of this non-attendance was due to ill-health, though as a matter of fact, sickness is known to have prevailed at the time to the extent of making the discontinuance of the school necessary.

We come at last to Boards of Health, local and State. A valuable report is issued annually by the State Board which the State might well afford to distribute largely among the people. It makes valuable suggestions to the towns. It formulates inquiries and in turn gets responses from physicians and others. It discusses sanitary subjects, investigates local and epidemic diseases. There is almost no end of good work that it is doing, but we fail to find that school hygiene or school sickness has ever been to any extent mentioned or scientifically considered. A model school-house has been described; typhoid fever in Yale some three years ago was investigated and reported. But no systematic and thorough study of the health of the schools has been carried out, though there has been a suggestion that such an attempt would be made at some future time. Our State Board of Health may share, perhaps, the feeling of the local boards, that our schools are under the control and guidance of other men and other boards, and that it would be an intrusion to invade their precincts.

Again in our search we turn to the code of school laws to find some sanitary or health enactment, but out of the three hundred sections of the school laws nothing pertaining to the health of the schools except the enactment which empowers the Board of School Visitors to compel vaccination. The State constitution does not make any reference to the schools, except to make provision for the school fund. Neither do the proceedings of this society, which is the general organized health custodian of our State, show that any discussion or investigation has been carried on in this line except in 1887, when President Comings, in his address on nervousness, gave some timely utterances on the effects of over-pressure from study.

So far our inquiries concerning the health of

the schools have been futile. But the inference which might be drawn, viz., that there is no sickness in the schools, to our mind is not so strong as the suggestion which arises that the schools require that a more thorough inspection should be made in sanitary and health matters, to see whether or not any sickness exists.

It is a principle followed in all economic, social and civil interests to first investigate and get the data and facts. It is as much, or more, the object of this address to show the necessity of this work as to bring before you the evidence or the amount of ill health.

In other countries and in other States some inspections have been made, and there have been some partial inspections in our own State. In 1878, after the reports of the examinations for near-sightedness which had been made in the public schools of Europe and this country were published, the school visitors of Hartford caused an inspection to be made in two schools in this city, with the following result. In one examined by the late Dr. J. A. Steven 21 per cent. of the pupils were myopic; in another inspected by Dr. W. T. Bacon, of this city, 20 per cent. were found in like condition. When the prevalence of that change in the form of the eye conditioned largely upon badly constructed school rooms, affecting the amount and direction of the light, was ascertained by an inspection, its causes were inquired into and the disease has become much less prevalent. I visited, during the year, a new school house in another city of this State and the light was abundant, exceeding somewhat the amount required,—one-fourth of the floor space. It was stated that in the room having the oldest pupils no case of myopia was to be found, a confirmation of the good results growing out of inspection.

Dr. E. K. Root, in his report as consulting physician in the Normal School Gymnasium, says: "Out of a total of over five hundred and eighty pupils examined, one hundred and eighty-six—nearly one in three—show slight lateral curvature, elevation of one shoulder, stooping carriage, or unequal prominence of shoulder blades. Slight lateral curvature with elevation of the right shoulder was observed in a number of instances, and was undoubtedly due to faulty position at desk work, or badly arranged school desks and benches. The majority, however, show no constant change that can be ascribed to any one cause. Their condition is the result simply of lack of symmetrical exercise of both upper extremities during the period of growth."

Sir John Forbes says: "We lately visited, in a large town, a boarding-school containing forty girls; and we learnt, on close and accurate inquiry, that there was not one of the girls who had been at the school two years that was not more or less crooked."

These inspections made with reference to these deformities are frightful, and in connection with them I give the views of Dr. W. Arbuthnot Lane, Assistant Surgeon to Guy's Hospital and Surgeon to the Children's Hospital, Great Ormond street, London, who makes some timely remarks as to the condition of these deformities.

"In the young subject the rate of growth of any portion of an epiphysial line varies inversely as the amount of pressure it transmits. In other words, if one-half of an epiphysial line transmits habitually an amount of pressure which is greater than normal, the amount of bone which it develops is correspondingly less than that normally produced. If, on the contrary, the other half of the epiphysial line is subjected habitually to a subnormal pressure, the amount of bone developed by it is proportionately greater than the normal. In all the resting postures the mechanism of the skeleton is such that one portion of a growing line is exposed to an abnormal pressure, while another portion is exposed to a much less, or even subnormal amount of pressure. The frequent assumption of a single attitude of rest, not corrected by suitable variations in the attitudes of activity and rest, results finally in a progressive alteration in the form and function of the bones and joints." And we may add when these bony surfaces, changed in form, become dense and eburnated, they cannot be restored by treatment, either mechanical or by exercise, but the form of the skeleton is lost forever.

Dr. Root describes the majority of these deformities, much more common to girls, to the "lack of symmetrical exercise of both upper extremities." Dr. Lane would include also the lack of symmetrical attitudes of rest.

This opens for consideration not only the question of exercise, but turns attention to the school seats in use, and upon which we have, as a country, prided ourselves. But Mr. Northrup says: "The improved seats (the American) are recommended mainly as they favor erectness of posture. But it must be admitted that with poor seats, sometimes only deal planks, the posture of pupils in the French, Swiss and German schools is far better than that of American youth in our best furnished houses."

The American seats make a good furnishing for the room. But the schools are graded by scholarship rather than by size. In almost any of the school rooms we will find some older and larger pupil in a cramped position, and some smaller one with feet dangling in the air. If the deal benches are better adapted for combining "attitudes of activity with attitudes of rest," and varying them in character, then deal benches are the best seats.

We have offered these inspections as illustrations. Inspection, thorough and scientific, made in any direction would give unexpected results.

As a specimen of a general inspection I refer to one made in Sweden and Denmark, two countries having the lowest mortality rates of any in Europe or in this country, and, after England, having the highest surplus of the birth over the death-rate. I quote from an abstract of a paper read by Prof. Axel Key, of Stockholm, at the International Congress at Berlin, and which paper attracted great attention in the Congress. He states that it was found in the schools of Sweden, by a very careful inspection, that out of 15,000 boys of the Swedish schools 40 per cent. were ill in one way or another. In the preparatory schools 17 per cent. in the lowest classes, 37 per cent. of the next higher class, and 40 per cent. of the highest class showed illness. Similar conditions were found in Denmark. With regard to the health of girls the state of things was frightful. The percentage of disease in the 3,000 girls mentioned above was sixty-one, out of which 36 per cent. suffered from chlorosis, as many from habitual headache, 10 per cent. from curvature of the spine, and 5 per cent. from scrofula.

"These conditions," said Prof. Key, "were no doubt due to over-pressure." He concluded by suggesting that uniform international investigation should be made into the whole subject."

Our personal knowledge in regard to the sickness of the schools is not statistical nor numerical, but from a considerable amount of observation we can confirm in general the truth of the inspections which have been presented. We meet with sicknesses and prevailing diseases which have a direct reference to the schools, either to some unsanitary condition of the school-house, to the peculiarities of the school age, methods of study or to bad or indifferent management of the schools.

It is evident that inspection close and thorough will reveal disease. The same method if used will disclose the causes of many of them. We apply it to the

SCHOOL-HOUSE.

There have been great improvements in the construction of the school-house in the last thirty years. This is especially true of the larger and wealthier towns. Before this era, too often the school-house was a rude and plain structure, devoid of any architectural merit. Some of the best school-houses now take rank with the finest public buildings. In the rural and depopulated districts economy governs, and the school-house is hardly a fitting expression of any commensurate interest in education. But the graded schools have become institutional centers and an architect has no small task in many instances to devise plans equal to the wishes and expectations of the district and equal to the generous appropriation made. All this to a certain extent measures the popular interest in education.

Within the last few years my attention has been called to many of these school buildings both in and out of the State, and to some abroad. I shall refer for the most part to those in this immediate vicinity as best known to me and from their general standing can in no way be said to be exaggerated illustrations.

Mr. B. G. Northrup, the late Secretary of the State Board of Education of this State, having observed the schools of this country pretty extensively, and those in Europe, states in one of his later reports that we need not shrink from the comparison of our school-houses with any European country, and he also adds that no city of its size in America can show better school edifices than Hartford. As Mr. Northrup makes those of Hartford the best in the world for any place of its size, it is quite safe to assume that there are none better in the State than those in Hartford, and especially safe in this assumption as since Mr. Northrup's statement was made many have been reconstructed and some new ones built. My observation, as far as it goes, agrees with Mr. Northrup's statement. But I now introduce some facts concerning these same Hartford school houses taken from a report of the Board of School Visitors of this city in 1889, after quite a thorough general inspection had been made. As the report is one of length I refer to it without giving the exact language.

The Board says that no school building was found in a perfectly satisfactory condition; something unsafe or unsanitary was found in all of them. Many of them were unsafe in the matter of fire from their heating arrangements and in the event of burning there was no ready way of escape. Others had tile soil pipe within the building with broken or open joints and unventilated; foul and unsanitary water-closets within the building and, if outside, not sufficiently separated from the school-house; empty traps, crowded and insufficiently ventilated rooms. Insufficient heat and light, flues which were dead, or if they worked at all, worked in the wrong direction, poor locations. One large central and wealthy district had all these defects and more. The school-board says of this school-house, "Words fail us in speaking of this school building. It is thoroughly unsafe and out of order from beginning to end."

Of one school-house Mr. Northrup says: "I do not know where else in the world can be found a school-house for the children of operatives surpassing it." The committee found this school-house to be a four story building, entrance upon the middle of each side into a common hall from which ran a central stairway to the top of the building. Underneath this lower hall through which all the children passed in going to and from was the furnace. In the basement at either end were the water-closets or water troughs or latrines,

and these were adjoining the hot air chambers. The committee recommended the removal of the latrines and the erection of a fire escape.

Mr. Northrup honors another school edifice by putting an engraving of it in his report. The acting school visitor of the town at that time informed us that he had seen in this building seventy-five scholars crowded into a room fifteen by twenty feet. That does not now exist. Such are some of the faults of the model buildings in this fair city so distinguished for its school edifices. There is no doubt but that a thorough inspection of school-houses in any city or town of the State would reveal the same or a worse state of things. It was not my purpose to speak of any special points which this inspection brought to light, although many of these conditions cannot exist without being the fruitful cause of disease. We pass, then, over the site or locations of the buildings and the condition and use of the basement stories, mostly occupied with the heating apparatus and as play rooms for the children, the plumbing worn out in the older buildings and imperfect in others, the cause of filth diseases in some districts. More attention however, is being given to sanitary plumbing, and a healthy fear has arisen in the public mind for blood poisoning. All this has been brought about by sanitary study and efforts of the Boards of Health. But there are one or two items in this part of our subject upon which we wish to remark.

VENTILATION.

The most serious defect found in the schools under examination was the imperfect ventilation. Much attention has been given of late to this subject, but among the masses of the people the fundamental principles are not understood, and our architects and civil engineers have not come to any consensus of views as to the best methods to be employed. It is my deliberate opinion that bad ventilation has more to do with the impaired health of the schools than any other one thing. Most of the Hartford schools depend upon natural ventilation. Only one school has mechanical appliances and two or three have partial aspiration. The impure air escapes through flues, but they are insufficient in size and badly located. Hence resort is had to open windows and doors to obtain any fair degree of ventilation. The general result is that there is no system.

It would exceed our limits to discuss the question of a perfect system. But such a system is possible. Let the dimension and requirements of a school-house be known, the amount of fresh air needed for each scholar per minute, the temperature of the air on admission, temperature required for the room, rate of air currents by actual air tests, the highest allowable limits of carbonic acid, no open doors or windows. A con-

tract including all these specifications could be made with a guarantee for its fulfillment.

No air should be used for respiration that has over seven vols. of carbonic acid to ten thousand of air, ordinary air having four vols. The schools to which Mr. Northrup refers cannot keep, by the ventilation provided, the carbonic acid down to thirty vols. Open windows are resorted to, but they are uncertain and unsafe. Uncertain because they disturb the flue ventilation and should the external and internal temperature be alike they would afford little ventilation, and are unsafe because if there is an exchange of air, dangerous draughts are occasioned. To this poisoned air of respiration is added the natural excretions of the skin, the emanations from the uncleanness of the body and clothing. Some children bring with them the characteristic odors of their homes, the fumes of the kitchen, the sickly smell of unventilated rooms. Besides, the air of the school room is impregnated by many of the odors of disease, the discharge of ulcers, decayed teeth, bad throats and fetid eructations. The school room thus becomes the mart of the district, where the germs of disease and putrefaction find their best place for development and dissemination. People have come to feel the imperative need of attending to sewerage to carry off the fecal and urinary wastes so as to prevent accumulations and hurtful effluvia.

It is well to bear in mind that as much weight of matter emanating from the lungs and skin is to find its way out of the flues and windows, as goes downward into the earth by way of the water-closets. We estimate from data on this subject, that a school-room of fifty pupils would throw off in the form of cutaneous and pulmonary exhalation, in one month of five hours each day, 750 lbs., which contains much putrescible matter, and in rooms deficient in ventilation this is precipitated, and gives in its decay the peculiar odor of the badly ventilated rooms. These respiratory impurities furnish the best possible conditions for the growth and dissemination of microbes. "Carnelly found in dirty school-rooms with the so called natural ventilation, in the same volume of air, nearly 2,000 living bacteria, while in mechanically ventilated schools there were from thirty to three hundred." Children from homes infected with germ diseases, consumption, scarlet fever and diphtheria, will poison the air of a room unless the floating germs are carried off by fresh currents of air.

The air space allowed for each child in the schools in Hartford is 225 cubic feet, with the air to be changed three times per hour. This is about one-third of the amount needed. But the Board of School Visitors has been asked to approve plans for a new building where the cubic space did not exceed 45 cubic feet per scholar. This is a very good illustration of local school

management. Boston seems to be about as badly off, judged by the figures of the Report of the Chief of District Police. "In 1889, 163 school-houses in Boston were inspected, and 146 are without any modern or efficient means of ventilation, being dependent upon the old-fashioned shafts in the walls, aided here and there by small apertures through the external walls, all of which are too feeble to be called ventilation."

People do not sufficiently realize the hurtful nature of impure air—how it vitiates the blood and interferes with the circulation, accumulating in the right heart and lungs, and produces asphyxia in some degree; undermines the constitution; lays the foundation for serious organic disease, preëminently consumption. It is estimated by competent observers that 40 per cent. of all fatal diseases are due directly to impure air.

Dr. Cornelius Black, of London, in answering the question, "Which side of the heart is the more frequently affected by disease?" says that the carbonic acid, rendering the blood impure, debilitates the right side of the heart, and the bad air of school-houses, as now constructed, causes a dilated right heart, and tricuspid incompetency.

I know a young lad, robust and healthy, fond of school, but the air of the school-room gives him a headache which results in vomiting, unless he goes into the open air.

SAFETY FROM FIRE.

The School Board found seven buildings out of eleven unsafe for want of sufficient exit in case of fire. In these there was only a single possible way of escape, and that was from the centre of the building, and generally directly over the furnace or boiler, which was in the basement. Only two of the schools have the heating apparatus outside of the building.

This is a very important matter. In this country the destruction of school-houses, asylums and hospitals, by fire, being no infrequent accident. Even the alarm of fire among school-children is accompanied with panic, and often with serious loss of life. Safety demands that these buildings should be practically fire-proof, at least the corridors and stairways. The latter should be constructed of iron or stone, the wainscoting being of brick or tile. It requires some experience with the fearful calamity of fire to give emphasis to any words upon this subject. A few years ago, when the Hartford High School building was destroyed, though no lives were lost, the fire occurring in the night, yet it was easy then to get an appropriation for a fire-proof building. It has been in my experience to have witnessed some of the larger battles in the late civil war. I have seen the field covered with the slain; but the sight was not so sickening or revolting as when, in after years, in another State, I witnessed a long

row of little school-children burned or suffocated to death. The battle field told the story of heroism, of undying devotion to one's country, and the great sacrifice that loyal hearts were ready to make for the preservation of the Union, and the restoration of National authority. All this would live and go down through the ages in song and in story—but the smouldering ruins of the school-house and the little charred bodies only told the old familiar story of carelessness, indifference or greed, all to be forgotten in the passing of a day.

PECULIARITIES OF AGE.

There are certain conditions of age, growth, periodicity, and peculiarities belonging to the school age, affecting health. We designate the school age as from 5 to 15 years of age. This period has the lowest death-rate of any, being seven per thousand, while for all lives the death-rate is from eighteen to twenty per thousand, and is in great contrast to the preceding period of infancy, which, according to the census of 1880, in the first year of life has a mortality of 170 per thousand, and in the large cities the rate is much higher.

Of the deaths of school-children, the Pennsylvania State Board of Health shows that at least 30 per cent. were from diseases regarded as preventable.

But notwithstanding the low death-rate of the school age, there is on the other hand a high rate of disease, not accounted for by the special diseases of children, and which might be prevented by better sanitary conditions of the schools, and by a better appreciation of the laws of growth and development of childhood—preventing future invalidism. A child who rests upon the sacro-iliac synchondrosis of one side before there is a growth of the articulating surfaces, will develop lateral curvature. So a child, at the time when the peripheral nerves are comparatively larger than the nerve centres—when the spinal cord predominates over the brain, or the medulla oblongata possesses functional superiority, who should attempt the higher cerebral functions, will easily have exhaustion of the brain, ending in some form of neurosis or in cerebro-meningitis. The natural but unexplainable periods of retardation must be recognized and studied.

Prof. Key, before quoted, has made accurate observations concerning the law of growth and retardation in the schools of Sweden and Denmark. He reports on the measurements and weights of school-children which had been taken in Sweden and Denmark during the last ten years. The results obtained in 15,000 boys and 3,000 girls, showed that in the seventh and eighth years the increase in stature and weight was very marked in boys. Afterwards, however, a retardation occurred which lasted to the fourteenth year, in which a rapid increase of growth again

occurred. This increase lasted up to the seventeenth year; it was most marked in the fifteenth year; the least increase in the preceding period was in the tenth year. The increase in growth was first in stature, and it was not until later that it also showed itself in the weight. The increase in weight lasted up to the seventeenth year, when the bodily development was complete. In girls the case was somewhat different. The decrease in growth after the eighth year was not so marked as in boys; in the twelfth year it had already given place to a great increase in height. The increase followed that of height, but exceeded it in the fourteenth year. In the seventeenth and eighteenth years the increase in height was but slight, the increase of weight, however, fell nearly to zero in the twentieth year. At that period growth seemed to be completed. Prof. Key says that the diseased percentages were highest in the period of retarded growth. And in the time of the greatest increase of growth they were the least.

Sometimes we are consulted because a child in these specified periods does not grow—is stunted; and again when a child is growing rapidly. In the one case there is apprehension of some disordered condition, and in the other that there will be.

TEMPERAMENT.

This is a natural condition, but is affected by school life. By the older physiologists much that is fanciful has been written concerning temperament. The kinds and combinations have been minutely described. This much is true, that there are certain constitutional differences in persons which grow out of the variety of relations and proportions existing between the constituent parts of the body, and which, to a certain extent, influence the dispositions and characters of men, and have a marked influence upon the functions of every part of the organism. Some men have a happy disposition, and, like Joseph Priestly, can go through life always cheerful, though suffering reproach at the hands of their fellow men. But for the many, the disposition is largely formed or fashioned in childhood. The parent or teacher can make or spoil the child in this critical age. They have an influence in this direction equal to or greater than the bile, lymph, or blood even, to impart a feeling of felicity, or gloom and depression. Felicity causes the heart to beat full and strong, brightens the eye, expands the chest, aids digestion, gives to every movement grace and steadiness. The old belief that pupils must have pain and suffering to acquire knowledge is exploded. Herbert Spencer formed his educational system quite largely upon good feelings. If we cannot go so far with him, yet we do not err in making the school and studies agreeable, and so healthful.

STUDY.

A full comprehension of the effect of study on the health requires a knowledge of the laws and limitations of the mental organism itself, and the union of this entity with the physical organization. The right conception of study—of education, is the systematic and symmetrical growth and development of mind and body. Such study produces healthful results, and is expanding to both mind and body. Study is not incompatible with health. It is a well-known fact that those who have devoted their lives to hard study have had a greater longevity than any other class of men. Take as an illustration the Presidents and Professors of Yale College. Of the nine Presidents who have died the average age was 70 years, and of forty professors the average age was $65\frac{1}{3}$ years, and the average of all graduates of Yale in the eighteenth century was nearly 62 years. This is indeed a remarkable record.

But the mind requires a natural development of its powers, the faculties to be expanded in harmony with each other. Some teachers not only seem to look upon the mind as an entity to be handled separately from the body, but that any faculty can be cultivated *ad libitum*. This is always at the risk of an abnormal mental development and of a general impairment, initiated from a local mental strain or over-doing. That process of education called memorizing is useless and hurtful. It not only takes away from the fullness of other mental processes, but may imperil the whole organ.

Dr. B. N. Comings, in his address to this society as President six years ago, on nervousness, had examined this whole matter of over-study very thoroughly by actual inspection and by means of circular letters, and says as a result of his inquiries, that "fully one third of the children in our graded schools suffer seriously from over-work in their studies; then become nervous and irritable at home, lose their appetites, and run down generally during term time. Nervousness is becoming a prominent characteristic. Diseases of the nervous system are on the increase."

Dr. H. P. Stearns, in his work upon "Insanity, its Causes and Prevention," in his admirable chapter on the influence of education, says in reference to the competition for prizes and scholarships, "from personal observation, I am satisfied that some of the brightest minds are essentially ruined for the accomplishment of any large work in life by such a course of conduct in their education, who, under some other course of management, in which these mental tendencies could have been better understood and guided, might have been saved; and that often these are minds with the best natural endowments."

Dr. Andrew Clark says, "I am a witness to the grave and sometimes irreparable mischief

done at schools and in working for competitive examinations." There is a large amount of medical experience recorded of the pernicious effects of undue study, long lessons, many studies, memorizing, competition, prizes, scholarship, etc. Every physician is meeting with cases of brain trouble from something vicious in the plan and course of study. Its range is all the way from brain weariness and nervous exhaustion to congestion and fatal inflammation of the brain or insanity. We have seen many such unfortunate cases, but it is difficult to convince the teacher or parent that study was an element in the case. They always ascribe the result to some accident, some blow or fall. Sometimes a slight injury may be the exciting cause of meningitis in one whose brain has been predisposed by over-excitement in study. We have not in this country reached that fearful condition indicated by this statement, taken from one of our journals which reads thus: "The statistics of suicide among school children in Prussia during the six years, from 1883 to 1888 inclusive, show that during that period two hundred and eighty-nine children took their own lives. Of this number two hundred and forty were boys, and forty-nine girls. In 29.8 per cent. of the cases no cause could be assigned; but as regards the others, fear of punishment or of the examinations, excessive ambition and insanity were found to be the inciting reasons. These figures are amazing and seem hardly credible."

Instead of this impulsive and tragic form of German or European insanity, our children may receive mental strains, which, like any other form of brain injury, is rarely fully repaired, and may end later on in mental incapacity or insanity.

Granting the European tendency to suicide, still it shows that the school system of Germany fails to develop the individual into a strong, independent and regulative character, and is a lesson from the older to the newer civilization.

The suicides in the whole of Europe, of boys and girls, amount to two thousand annually, and there seems to be an ethnological fact connected with it without any ethnological reason. For statistics show that the central area of European suicides is Germany and the borders of the adjoining States. But the German children in this country are not characterized by a suicidal mania. The Americans do not find, on the other hand, that the climate of Germany is depressing. We attribute youthful suicide in Germany, so far as the schools go, in part to study, excessive ambition, and to a fear of punishment. Such punishment cannot be meted out to the derelict and delinquent in this country. The European schools seem despotic. Children are punished for offenses, and in ways that would not be tolerated in this country. I visited in Lucerne a fine, large school in the country, where the humane,

sympathetic, philanthropic educator Pestalozzi was born. Here the teacher who was my guide seemed to take pride in showing me the dark dungeons in the basement where the scholars were confined for any misdemeanor. When visiting the University at Leipsic I was invited to visit the prison cells to see the names and the works of art inscribed on the walls by incarcerated students. The rector of the University holds over the students the power of life and death.

AGE AND TIME OF STUDY.

A child is never too young to learn, but too young for a school of training before 7 or 8 years of age. The soft pliant brain has not steadfastness enough for reflective processes and soon tires of its perceptive glancings. I do not believe that the kindergarten furnishes the desideratum. It may be better than a poor home, but a poor substitute for a good one. The children in the kindergarten always look tired to me. Enforced play gives weary and sad looks.

The time of study in the schools does not at first sight seem excessive. But men who have distinguished themselves by brilliant learning have made short days. The teacher finds the day long enough. The discount and insurance clerks have but a little longer day. But it is the lessons that must be learned out of school, and the worry from lessons unlearned that cause most of the harm. The Boston schools forbid study out of school hours for the girls.

MANUAL AND INDUSTRIAL TRAINING AND EXERCISE.

In the early years of the schools, and now in the rural districts, the problem of exercise has been solved by the necessity of assigning to the children a certain amount of work. Our country abounds with frequent examples of the attainment of ultimate, physical, and intellectual success, where the conditions seem to have been a reciprocal influence of work and study, and such necessity has helped to develop manhood and a right feeling of the value and dignity of labor. But at the same time there ought to be mingled with this work and study the graceful and frolicsome games and amusements in which children engage. Sportive activities should make a part of every child's physical programme. Every one has seen the energy and zeal with which children carry out their playful sports. Such positive joy and satisfaction is highly invigorating to mind and body. But even this exercise should be within limits. A child may physically over-act and be unfit for mental improvement. Many parents and teachers have the impression that a child in danger of harm from excessive study may be sufficiently guarded from injury by an extra amount of physical exercise. This is entirely erroneous. There is only so

much nervous force and energy to be expended, and if it is exhausted mentally it cannot be regained by any demand made upon the physical energies. Mind and body must, to reach the highest results, be exercised proportionately and within certain and proper limits. We have seen cases of nervous exhaustion, disqualifying for any study, brought on by over physical exertion. Many of our higher institutions of learning, and some of our cities, are providing a gymnasium for regulative exercise, and industrial schools where some useful experience can be obtained in the right use of mechanical tools, etc.

We hurry to make the boy an adult, forgetting that the longer we can keep him young the longer will he live as a man. Exercise, either as work or play, as we have implied, must be within limits. We have seen by the sharp fierceness of competition in games, more frequently, injury of some physical organ, hernia or cardiac disease, and nervous exhaustion from exercise and study combined.

The natural system of instruction of Pestalozzi and Frœbel, the former taking the form of industrial training, or the older children, the latter of the kindergarten for the younger, is now sought to be applied to the children of intermediate ages, and to make manual and industrial training common to all the schools. How this shall be done is not our problem to solve, or how it will effect respectively the educational and economic interests of society. But whether the sum of expended physical and mental energy will diminish the vitality of the child is the question for our consideration.

MANAGEMENT.

We use this word in its widest sense; we mean to include the legal provisions made for our schools and the personal supervision given to them. Some of the characteristic features of the Connecticut schools go back to the early settlement of the colony. Some things that were wise and good then might be changed for the better now.

SANITARY LEGISLATION.

As has been intimated there has never been any sanitary legislation for the schools. They have been under the general supervision of boards of school visitors, and, as a part of the towns, subject to such health regulations as the local Boards of Health have adopted.

We have shown by the unsanitary conditions of the schools, by the amount of sickness which is preventable, that local supervision by school and health boards without special legislation has proved itself inadequate.

The Boards of School Visitors are not, as a rule, composed of men who have made health matters a study. The Health Boards are political appointments for the most part and sometimes made

in the interests of the opposition. In some few towns of the State they demonstrate the usefulness of the organization. But the present work of these boards through the State is forced upon our attention when we read what the secretary of the State Board has to say publicly of them. "The most prevalent heresy now existing among the health officials of the small towns of Connecticut is a deep-rooted skepticism as to the real need of their official existence. Because from year to year they do nothing, they take the unjust inference that there has been nothing to do, which is equivalent to saying that the towns over which they have sanitary supervision are now and have been for many years in such excellent hygienic condition as to be incapable of being improved. Another fallacy, closely related to the last, is the idea that a local Board of Health should be a passive rather than an active organization; that of its own volition it should never take cognizance of any unsanitary condition; that a Town Board should occupy the dignified position of a court of appeals, and take no action, whatever may endanger the public health, until the threatened danger is brought to its attention by other parties."

And it must be remembered that this picture is drawn of men who fail to do their common ordinary duty and does not refer to the schools, which almost as by common consent they wholly neglect.

Every argument that is good for sanitary laws for the factories of the State applies with equal force to the schools. The State in its wisdom four years ago enacted laws relating to the factories, and factory inspection. The same law, mutatis mutandis, would be a good one for the schools. Its short trial has demonstrated its necessity and can point to much good already accomplished. The report for 1890 shows that seven hundred and ten changes were ordered and that most of these orders were fully complied with. Many of these defects were found among the best managed factories in the State.

Massachusetts, the State which is now acknowledged to have the best schools in this country, one hundred years ago fully recognized in her State constitution the importance of State legislation and control of her schools. She has had a factory law, and since 1888 a sanitary law for the schools. The factory law has been a little longer in operation and shows more definite results. We subjoin the School Law of that State.

SECTION 1. Every public building and every school-house shall be kept in a cleanly state and free from effluvia arising from any drain, privy, or other nuisance, and shall be provided with a sufficient number of proper water-closets, earth closets or privies for the reasonable use of the person admitted to such public building or of the pupils attending such school-house.

SEC. 2. Every public building and every school-house shall be ventilated in such a proper manner that the air

shall not become so exhausted as to be injurious to the health of the persons present therein. The provisions of this section and the preceding section shall be enforced by the inspection department of the district police force.

SEC. 3. Whenever it shall appear to an inspector of factories and public buildings that further or different sanitary provisions or means of ventilation are required in any public building or school-house in order to conform to the requirements of this act and that the same can be provided without incurring unreasonable expense, such inspector may issue a written order to the proper person or authority directing such sanitary provisions or means of ventilation to be provided, and they shall thereupon be provided in accordance with such order by the public authority, corporation or person having charge of, owning or leasing such public building or school-house.

SEC. 4. Any school committee, public officer, corporation or person neglecting for four weeks after the receipt of an order from an inspector, as provided in the preceding section, to provide the sanitary provisions or means of ventilation required thereby shall be punished by fine not exceeding one hundred dollars.

SEC. 5. The expression "public building" used in this act means any building or premises used as a place of public entertainment, instruction, resort or assemblage. The expression "school-house" means any building or premises in which public or private instruction is afforded to not less than ten pupils at one time.

A comparison in Essex county of the factories and schools shows that the former affords eight times more cubic space per person than the schools, and had on the average only eight parts by volume of carbonic acid to twenty-one parts in the schools. These facts for the factory are cheering but for school sanitation disheartening. But the working of the Massachusetts school law, which was fiercely opposed at first, is now meeting with great favor, and will work changes in the schools that would not have been otherwise effected.

Connecticut is behind, but she has in operation the factory laws, and begins to note beneficial results. In this she has legislated for better ventilation, for good sanitary conditions of water-closets, fire-escapes, and many other things, and holds the person or corporation at fault responsible for all damage, besides a fine of not less than \$50 nor more than \$500. This is a statute law for the health and safety of operatives in the factories of this State. But why do the 135,000 operatives in the factories of the State need legislative protection more than the 161,241 children in our schools? The former are mostly of an adult age and capable of looking out for themselves, the latter are generally dependent and helpless, and to-day probably the school-houses, like those in Massachusetts, are not in as good a sanitary condition as the factories.

INSPECTION.

We have seen that when an inspection has been made, results have shown that it was needed, judging from the defects brought to light. But a thorough inspection, which is to go into all the details and to be a matter of record, must include

the good as well as the bad features of the school. Such a registration is made up of constructive details, working functions and the septic or aseptic conditions of the schools. This registration must be complemented by a complete health record of each day, which the school register can give. If scholars have ailments or are at home sick, the register will note the fact and their disease, so far as can be ascertained.

When these inspections and records have found their way to the central bureau they can be classified and compared, and it will be possible to determine where the defects are to be found, their nature and the best way of removing them; what diseases have prevailed, their causes and the prevention suggested. Such results can be tabulated, and will be of service in future comparisons.

The power of an inspection for good is very great. I have known the sickness in a school district first to have awakened suspicion of the school-house, which led to an inspection, and this to a warm discussion as to repairing or building. The first feeling was to repair, but as the facts of the inspection were canvassed, the outcome was a new school-house costing \$100,000. This grew out of an inspection.

We may call attention to the report made two years ago by the State Board of Education in one of the counties of this State. Probably the schools in that county were in no way different from those of any other county in the State, no better nor worse, and yet, so shameful was the condition found, so damaging the reports, that some threats were even heard in other counties if the work of inspection went any further. There is at first a feeling of repugnance to inspection, growing out of a suspicion of espionage or of meddlesome interference. But when it is known that the examination is in the hands of skilful and expert men, done legally and followed by good results, the prejudice soon yields. So in the examination made by the Board just alluded to, threats gave place to invitations to have the work done. Great good has resulted from that examination of a single county, though it was made along the educational rather than the sanitary lines.

It has always been a difficult problem how to conduct a school in reference to the infectious and contagious diseases. These diseases are practically narrowed down to the two diseases, scarlet fever and diphtheria. But if the prevailing type of measles is malignant, it will be put into the same category for management. Towns exercising ordinary care for their schools require notification, isolation and perhaps disinfection. If this were thoroughly done, these diseases would be to a great extent diminished. But it is not practiced over most of the State. Not long since, the largest city of this State made its difficulties in this matter public as follows: The committee on

schools sent a letter to the Board of Health, calling attention to the prevalence of contagious diseases in various parts of the city. In this letter they say "that the authorities show inexcusable laxity, and that they can cite instances that would indicate criminal negligence on the part of some physicians in the city. "The committee has evidence that there have been cases of scarlet fever where not only was no notice sent to the schools, but the death certificate was the first notice the health office received. Also that school children have been allowed to view the remains of children who have died of diphtheria. The President of the Board of Health said that some physicians were very neglectful, and one or two had been notified that, failing amendment, they would be brought before the courts. He also adds: "Scarlet fever has been propagated in several wards through the negligence of some of our physicians. Public funerals have been held, and no attempt has been made to guard against the spread of the disease. Some one was culpable, and it was the attending physician. A case in point came under my own observation only a short time ago. I learned," says he, "that a wake was to be held over a person who had died of diphtheria. I immediately notified the family of the true character of the disease. They were surprised, as the physician had not notified them that it was contagious. It is not only the young physicians who are negligent, but the old ones as well." Now the health officer says: "The only evidence we get of some cases of contagious diseases is the death certificate. In nearly all of the schools the principals and teachers know of the existence of contagious diseases. We have no way of preventing children from attending a funeral. I know of the case to which reference is made in the letter. I visited the place an hour and a half after the death. The parents promised not to allow anyone to see the remains. It seems that children did, however, and there is no help for it. Many principals, in their eagerness to have their schools make a good showing, allow children to return to the schools before it is safe for them to do so. I have heard of a number of cases where children who have been ill with scarlet fever have been allowed to come back to school before they were through desquamating."

It is seen that the school committee blames the authorities and the physicians, the President of the Board of Health blames the physician, and the Health Officer finds the principals of the schools and the parents at fault. But the moral of it all is, that the rule of notification and isolation is practically worthless.

But with notification, isolation and disinfection there must be more inspection—reasonable in kind and amount. Dr. Seibert, of New York, goes so far, in an article on the prevention of diphtheria and scarlatina, as to recommend that

the throats of all school children be examined every day by a physician, using the child's finger for a tongue depressor. It would require for New York City 300 examiners. Such inspection seems at least special and expensive. But New York has about 2,000 cases of diphtheria annually, and the same of scarlet fever, which means about 30,000 cases of sickness from both diseases, at a cost to the city, directly and indirectly, of millions of dollars. Such an inspection would cost New York \$300,000 annually. It might save hundreds of lives and a great amount of money. The inspection proposed for our schools would not be expensive, and would prevent these diseases at almost every point. It would travel on the lines that no foci or medium of contagion should exist, which is better than to be obliged to note their outbreak.

Many foolish customs and habits which now prevail would be set aside, as for example, we saw within a few years the children, clean and unclean, of a primary school, on leaving the room give the teacher a kiss. Now, suppose the first child was coming down with scarlet fever or diphtheria. No one can tell how many lives would be endangered. Good inspection would also keep out the filthy garments that find their way to the school room loaded with diseased germs. The clothes of the poorest child may be worn and patched, but they can and must be clean.

It has been seen that the carrying out of local health matters is largely a failure. The local or district management of schools is but little better, and the history of the Connecticut schools shows that one hundred years ago when the towns relinquished their control to the districts it was a grave mistake. With this experience the matter of the health of the school cannot be left either to the local board of health or to the district, for in such circumscribed localities the requisite talent and fitness is scarcely to be found and unless the law defined the duties of each, as it does in New Jersey, there would be constant clashing between them. This work must be entrusted to skilled men, independent of local prejudices and influences, and to men competent in school matters and of a character to entitle them to consideration. It could be entrusted to either the State Board of Education or of Health, as is the case in New York and New Jersey. But our State Board having such a bureau in charge, would require the services of hygienic experts. The State Board of Health could not depend upon the health boards of towns. Massachusetts has a special bureau called the District Police, which seems to give satisfaction.

We would not be understood as disparaging the work or the influence of our present State Board of Education. They are working along the educational lines and doing all that the law

permits them to do. They have a secretary who devotes his time to ascertaining the condition of the schools, enforcing the truant laws, superintending the State Normal Schools, attending conventions, and making annual reports. All this is promotive of great good, but as now constituted, without any sanitary or medical men on the board, it would be inadequate in the very nature of things to superintend the health department of the schools.

INSTRUCTION.

No sanitary laws or system of inspection can be enacted that stands in any degree above the public sentiment of the State. To elevate public opinion is a part of the work to be done by the friends of our schools. Science and sanitary measures must be better understood in the community. They should form a part of the school curriculum. The graduates of our normal schools should be fully taught on the whole subject. They should know a good and a bad school house at sight, and be able to give a critical opinion, to measure the pupil in his organization, his growth, development, temperament and capacity.

Hygiene has of late been introduced as an optional study in the schools. An outline text book or syllabus has been adopted. This is inadequate. A full text book, well illustrated, is needed to insure success. Something might be done with the advanced scholars in selective reading from the current health literature. Whatever knowledge is gained in these matters in the school will be known and discussed at home. Teachers and schools need for a time special instructors to look after this branch of study in towns and larger districts until the subject is more fully introduced.

I have, gentlemen, for the purpose of illustration, given some facts concerning the sanitary condition of our schools; the amount of sickness or physical impairment which an inspection here and there reveals; the phenomenal absence of all sanitary legislation and the great need that exists for skilful and thorough sanitary inspection and supervision.

I could not have made these suggestions to any class of men more ready to appreciate the conditions indicated. It is to be presumed that some of you are officially connected with the schools, but if not, the observations made in your professional lifetime will have disclosed to you more facts than can be related in one brief hour.

It has been said that the Connecticut school has relatively declined. It may be that in the great success, in the glorious tradition of the early schools of the State, we have relied too much upon our inherited advantages, or been too conservative in the adoption of the new methods

of study and management, successful in other States. But our discussion confines us to the lines of health. We presume that in the first schools planted here in the wilderness, though they were under the supervision of such illustrious men as Davenport, Mason, Hopkins, Hooker and Eaton, some of whom had studied the free schools in their exile home in Holland, the matter of school sanitation had never been discussed. Neither did the pilgrims on board the Mayflower discuss the question of putting a steam engine into that little ship. Sanitation is a word of this generation, and already is not fully expressive of the most advanced ideas in this direction. The hygienic watchword to-day in Europe, more than in this country, is asepsis. It is this that is cleaning the streets of the continent. It is reducing the death rate of cities, and bids defiance to plague and pestilence, and our mission as physicians in this great work is not ended until we see this great principle, not only pervading and permeating our schools, but made authoritatively and permanently effectual. When this is done a long step forward has been taken in regaining the reputation and the glory of the Connecticut school.

ORIGINAL ARTICLES.

RESTORATION OF THE PELVIC STRUCTURES AFTER INJURY.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5-8, 1891.

BY HENRY O. MARCY, M.D.,
OF BOSTON, MASS.

1. *The Cervical Lesions of the Uterus.*—Little is required to add to the completeness of our knowledge to the present date, upon the surgical treatment of lacerations of the cervix uteri. Thanks to the labors of our distinguished countrymen, the late Dr. Sims and his early associate, Dr. Emmet, of New York, the limitations and advisability of the surgical repair of the cervical tissues of the uterus are generally well understood and accepted by the profession at large, as taught in the great surgical centres of the world. The restoration of the cervical tissues after the proper refreshment is greatly facilitated by the use of the Hagerdon needle, which pierces accurately and with comparative ease the thick, firm cervical tissue. The interrupted silver wire suture, so long used by the followers of these great masters, has been most advantageously supplanted by the continuous animal suture, since this at least equally well holds the restored parts *in situ* and demands from the surgeon no attention subsequent to the completion of the operation. This is, in every way, a great gain by allowing the

parts to remain continuously at rest, saving the patient the anxiety and dread of suffering, consequent upon removal, and the surgeon oftentimes a delicate, troublesome manipulative operation in hunting after and removing the loop of wire. More important than all, however, it is a great gain in that the surgeon may at once proceed to the performance of other operations, if, as is generally the case, such are deemed necessary.

I suppose it need scarcely be added that the manipulative procedures, at least in the present state of our knowledge, are decidedly safer when performed in the most careful aseptic way, including irrigation with mercuric solutions. A vaginal tampon impregnated with iodoform completes the dressing.

2. *Operations on the Vaginal Roof.*—The first in importance, although not in frequency, of the lesions of the superior structures of the vagina, is vesico-vaginal fistula. Here, as elsewhere, we pause for a moment to consider the monumental labors of our great founder of gynecology. Without appreciating the first great cause of failure of sutures, as then applied, as due to septic infection, Dr. Sims accepted the metallic suture as a great gain over all material hitherto used, from the fact that it remained in the wound as an "unirritating" material. He demonstrated the better methods of repair, emphasized the primal importance of introducing the suture, so as not to include the mucous membrane, and worked out with painstaking care the methods of complete closure of the wound, and retention at rest of the coapted surfaces. His dexterity, skill and fertility of resources, are the admiration of all. In this operation, however, for some years, I have advocated the use of the continuous tendon suture, which I think preferable to wire for the reasons advanced in the consideration of its use in the repair of cervical lesions. The secret of success in the use of the tendon suture, is the same that pertains to Dr. Sims' operation, greatly aided, however, by our knowledge and appreciation of aseptic conditions, without which failure will ensue, no matter how carefully we obtain what Dr. Sims considered as the fundamental factors, retention at rest of the carefully approximated refreshed surfaces by the means of the "non-irritating metallic suture."

3. *Cystocele.*—The condition is not exceptional, where, for reasons already referred to, the anterior wall of the vagina has become so deformed that it produces a protruding pouch which contains the base of the bladder descending on a plane below that of the orifice of the meatus. Fortunately for the surgeon, the conditions here are quite unlike those which pertain to the posterior segment of the vagina in rectocele. Owing to the more or less constant effort in micturition, and other causes, the vagina, although weakened as a means of support, has become greatly thick-

ened anteriorly and its vascularization increased. The surgeon having determined upon a reformation of the vaginal tract, after having duly cleansed the parts, marks out the portion which he intends to resect. The size and shape of the piece to be removed will, of course, depend upon the conditions present. It may be a simple ellipse, or a portion upon either side near the cervix in addition may be deemed wise to be removed, possibly including the entire cervix, in certain cases of hypertrophy of the organ. Few plastic operations are attempted with more dread by the inexperienced, owing to the fear of wounding the bladder. It was on account of this that most of the early operations, where the attempt was made to pare off with the scissors the mucous membrane only, and intrafold the vaginal muscle, resulted in failure. The method of operation is really simple. At the commencement of the prolapse, above the urethra, a division is made entirely through the vaginal muscle to which the bladder is loosely connected. With a little care, by means of scissors, a desired resection is made, the loose connective attachment to the bladder making the separation easy. When in doubt, it is well to minimize the piece removed and adjust the edges the better to determine the effect, since it is easy to pare away the redundant tissue afterward, if necessary. We cannot help thinking that the following method of suturing is to be recommended over that generally in use. By means of a fully curved Hagerdon needle, introduce aseptically the animal suture, preferably tendon, in the following manner. It is presumed that the operation thus far has been done in the lithotomy position, the parts having been fully exposed, by the use of the retractor speculæ. The continuous stream of the irrigator washing the parts clean, the bladder wall is elevated by some flat instrument, and the suture is introduced, commencing at the cervical portion of the wound, from a quarter to a third of an inch away from the cut surface of the vagina, from side to side, in a continuous running or lacing stitch, thus completely approximating and supporting the divided edges of the vaginal wall by a line of buried sutures; the last stitch is carried entirely through the vaginal wall, at some distance from the meatus in front, away from the cut surface. A second line of sutures is carried from within outward, through the deeper portion of the vaginal wall, parallel to the first line, closely uniting the divided edges, and yet none of the stitches penetrating through the mucous membrane, thus making a second line of buried sutures. Finally the suture is made to emerge very closely to the exit of the first, where the two are joined by a knot and the ends cut short. The vaginal wall is now very carefully dried, dusted with iodoform, painted over with iodoform colloidum, into which a very few fibres of cotton are

introduced, and a dry tampon of iodoform wool is applied within the vagina. This method of uniting the refreshed parts in vesico-vaginal fistula is sometimes advised, where the wound is sufficiently large to allow of the union of the tissues by burying the sutures in their different layers. In both cases, a retaining catheter should allow the free escape of the urine in order that the approximated tissues may remain at rest. A rare form of injury to the parturient tract has been pointed out by Dr. Emmet, of New York, of which I have seen but a single complete example, although, I believe in a minor degree, it not very unfrequently is associated with lesions of the perineum. It consists of a more or less complete tearing away of the vagina from the connective tissue attachments to the surrounding organs, by its becoming folded over, or fixed, so to speak, to the advancing head in parturition. It is important to bear in mind the possibility of this lesion, of which the following case is an exceptional example. Mrs. M., aged 28, otherwise healthy, was sent to my hospital in 1889, under the supposition that she was developing cancer of the vagina. Her history, briefly, was that about 18 months previously, after a long and tedious labor, the first pregnancy, she was delivered of a still born child; convalescence was tedious and imperfect, with much local pain and discomfort continuing to the present. There was a moderate laceration of the perineum, but just within the vulva there was a firm, hard, inelastic ring, which barely admitted the tip of the index finger. Upon dissection it proved to be cicatricial, consisting of a fold of the vaginal muscle, which extended upon either side nearly to the meatus. Restoration of the parts was effected by dissecting, entirely free from its attachments, a little more than three quarters of the vagina quite deeply in its junction to the vulva. The perineal structures were now restored and the vaginal tissues normally rejoined to the vulvar outlet. A rapid convalescence followed with entire relief to the patient and complete restoration of the parts.

4. *Repair of Lacerations of Perineum.*—When incomplete the floor of the pelvis presents a great variety of changes, dependent upon the degree to which its structures have been weakened. When the sphincter fibres remain uninjured, the transversi having been separated, and by their perverted action the levator loop is drawn apart, a more or less pronounced rectocele is usually present. Obviously the chief factor in importance is to restore the relation of the groupings of the sundered muscles which go to make up the pelvic floor. A careful examination of the anatomical relation of these structures will make apparent that the injury sustained by the parts is *posterior* to the vagina, and hence, whatever operative measures we would undertake for their restoration, should include the parts in-

volved. Upon reflection, it is clear to all that this is not the vagina, and yet, singularly, nearly all surgeons content themselves by operating upon the vagina after denuding it of its *mucous surface* only. It is true the vagina is deformed, oftentimes stretched out to a thin muscular coat, the rugous surface of its mucous membrane entirely wanting, and yet nearly every operator classed as an author, has dwelt at great length upon the importance of denuding its mucous surface only with the greatest care, and then intra-folding its muscular wall with stitches taken in every variety of manner, and combination of lines, confusing in detail and grading into each other in kaleidoscopic pattern. It is owing to this, in by far the larger measure, that such confusing and uncertain ideas pertain to the profession generally, which makes the repair of the perineum, as usually practiced, one of the most unsatisfactory of operations in surgery. If it be true that the *structures* that go to make up the pelvic floor, and not the vagina, are the ones at fault, then it is equally clear that these are the tissues which merit and should receive our attention. It is not for a moment to be doubted, that most operators have, in a measure, included these structures in their operations upon the denuded vaginal muscle, but at the best this is accidental, faulty, and liable to failure, as we have seen in a similar operation when undertaken for cystocele. I cannot doubt that the true rationale of operative procedures and consequent satisfactory result should be based upon making the dissection *behind* the vaginal muscle and not *upon it*. The procedure is simple and easy.

In incomplete ruptures, with more or less prolapse, the transversus perinei muscle can no longer be felt as a band in front of the rectum, and the levator has lost its tonicity. The restoration of these with the various attachments of the sundered groups is the object sought. The patient is placed in a good light in the lithotomy position upon the table. An inflated rubber irrigating pan with a large efferent tube is placed under the hips. This is a great convenience for purposes of cleanliness. These were first made for me more than ten years ago by the Davidson Rubber Co. Somewhat recently, with slight modification, they have been introduced to the profession as the Kelly pad. The irrigation with a 1-2,000 mercurii bichloride solution is under the direction of an assistant and the entire operation is conducted with aseptic care. After the sphincter has been stretched and the lower bowel cleanly washed, introduce two fingers of the left hand into the rectum, which are not withdrawn until the operation is completed. The posterior third of the vagina is separated with knife or scissors from its vulvar attachments. The recto-vaginal space is easily found and the dissection is carried as far up as the crest of the rectocele

and into the lateral sulci, as far as is deemed sufficient. Their lateral sulci are formed by the retraction of the ends of the transversus perinei muscles, and it is important to dissect well beneath them and free their divided ends, for the reunion of these important structures is dependent upon the ability of the operator to seize upon and firmly hold them in the grasp of his sutures, thus rejoining them upon the median line. Dr. Emmet has very wisely pointed out the importance of taking up the "slack" of these vaginal tissues by his Y lines of suturing, but to my mind has failed to emphasize the pathological conditions and the causes which have produced them.

The separated flap is lifted and held by an assistant, then I introduce a large curved needle, with the eye near the point, threaded with tendon, from right to left, deeply from side to side, beginning at the very base of the dissection, guiding the needle by the finger in the rectum, so as not to puncture it. The suture is unthreaded, the opposite end introduced into the eye and the needle withdrawn. The suturing is continued in this way until the required number of stitches are taken. In rectocele with prolapse and large, deep sulci, the buried sutures are more deeply taken laterally and internally from side to side, in order to join the separated fibres of the levator loop with the retracted, transverse perineal muscle. Usually four or five of the double sutures are required; they are secured by a knot and the ends cut short. The remaining tissues are coapted by a light running suture taken from side to side until all the structures are joined. It is frequently wise to remove a small portion of the redundant, deformed, vaginal tissue, and the coaptation is completed, every stitch being taken so that the suture is not in sight, all remaining completely buried. The parts are carefully dried, dusted with iodoform and covered with a very thin layer of iodoform collodium strengthened with a few fibres of cotton. When the dissection has been properly made, the tissues thus coapted form a firm, full deep perineum. The finger introduced into the vagina recognizes at once the tense reconstructed pelvic floor. With proper dexterity the vulvar organs are reformed to the condition of those of the woman who has never borne children, and when the reunion is primal, which should follow the operation if done aseptically, the convalescence is rapid, without pain or oedema of the parts. It is well to cause defecation not later than the third day; micturition in the knee-chest position may be voluntary, but great care should be exercised to prevent the wetting of the restored tissues with urine. No especial restraint of body is required; a semi-reclining position may be assumed within a few days and the patient allowed to sit up for short periods of time

after the first week. Beyond the careful attention to retain the parts aseptic no subsequent dressing is needed. This, in my hands, has been best effected by keeping the parts dry, by the occasional change of the vaginal dressing, and frequent dusting with the iodoform blower. After some months it is often difficult to trace the line of reunion even under careful examination. I have somewhat recently had the opportunity of examining a patient, where I restored the perineum more than nineteen years since with perfect result, and during the subsequent years of my surgical experience, after a great variety of modification in detail, I have found the above method, all too briefly described, eminently satisfactory. My experience comprises several hundred cases thus operated upon, and it is the very decided exception that failure in any degree results. If for any reason failure ensues, the tissues are in better condition for subsequent operation than by any of the surgical measures usually recommended, since little or no tissue has been removed, all having been utilized in the restoration of the parts.

Operative measures advised when the rupture is complete do not differ materially in principle from those advocated in incomplete rupture. Here, for apparent reason, rectocele is absent, and the hæmorrhoidal venous plexus does not undergo deformation. The edges of the laceration are slightly refreshed, and the vagina from each side of the rent is dissected away as far as may be deemed necessary; usually, as already recommended, to include about the posterior third. The dissection is continued posteriorly on each side of the sphincter ani, in order to be able to reach the retracted ends of the torn sphincter muscle. The lower border of the rectum is reformed by a line of continuous tendon suturing, commencing a little above the rent, in the line of the dissection which has been made between the vagina and the rectum. The stitches are taken from side to side, laterally, within the margin of the refreshed tissue, and the suturing is continued quite to the reformed anal outlet, the end of the suture being left unsecured until a later stage of the operation. It will be noted that this running, or lacing suture, when drawn upon, is entirely buried within the refreshed tissue, while it everts the coapted mucous membrane of the bowel toward the rectal side. A similar line of suturing coapts and restores the vagina. The uncut end of the suture serves conveniently the purpose of lifting upward the vagina by the assistant during the process of coapting the several structures, which is done precisely as recommended in the reconstruction of the parts in cases of incomplete rupture. The double suture is applied deeply on either side of the sphincter, in order to coapt the retracted ends of this muscle. In the failure to do this, a weak sphincter will frequently be the

result, even if complete success has attended the restoration of the other structures. Preliminary to the operation, it is important to have the lower bowel well emptied, thoroughly cleansed by injection of sublimate solution, and a considerable ball of iodoform wool, with string attached for subsequent withdrawal, should be introduced high up into the rectum. The bowel is better moved by the fourth day, and a rectal tube may be inserted as early as the patient seems disturbed by flatus. By this process of restoration, the so-called pin-hole or recto-vaginal fistula can very rarely occur; in fact, I have never seen it to happen, although so commonly resulting by the methods usually advised. Success of course depends upon doing the operation under aseptic conditions, and retaining the parts devoid of infection during the processes of repair. I have frequently seen this most troublesome affection cured, as completely as when undertaken for the simplest of lesions.

I cannot help thinking that the measures above described are to be earnestly commended as simple, safe and effective; but they must be executed with the most rigid aseptic precautions, without which failure will not only ensue, but the gravest dangers, not alone to the parts involved, but to the life of the patient, may readily follow.

The pathological conditions which pertain to the rectal tissues result, in very large degree, from changes in the vascularization dependent upon the dilation of the hæmorrhoidal veins. These are often deformed to an extent rarely appreciated by the ordinary practitioner, and only to be understood by the surgeon, who makes the vivisection for the purposes of cure. I have elsewhere treated this subject in detail, and refer to it here for the purpose of completing the subject of plastic operations for the restoration of the pelvic structures in women, resultant upon pathological conditions. I am constrained to believe, as I think for abundant reason, that the ligature and cautery, destruction of the tissues by acid, etc., are not alone unsurgical and barbarous, but often fail in the end of securing the desired result, since a portion of the deformed structures, not seldom, remains unchanged, but also that tissues, of importance to preserve, are thereby frequently destroyed. A complete dissection of the deformed hæmorrhoidal plexus, as advocated by Mr. Whitehead, in my judgment, offers abundant reason for adoption, and the only criticism I have to make upon his method, is the closure of the wound with interrupted silk sutures. This method has been severely criticised and in great measure failed of general adoption, because of the fear of hæmorrhage, which during the indefinite past has been emphasized as liable to pertain to any of the methods applicable to the cure of hæmorrhoids. This is doubtless greatly overestimated by the profession at large. The dilatation of the

hæmorrhoidal plexus is, indeed, sometimes truly enormous, but it will be found, upon dissection, that the vessels quite within the grasp of the sphincter are usually very little changed, and that here their constriction is simple and easy. I have for some years operated in a way to be commended as in large measure bloodless, and assuredly without danger of subsequent hæmorrhage. The procedures are briefly as follows: The sphincter muscle is dilated and the parts put on tension by two fingers in the rectum. Either with a sharp knife or scissors, division is made upon the line of the juncture of the skin and mucous membrane. With a little care, the veins are separated from the loose folds of connective tissue without injury, down to the line of the sphincter muscle. They will be found closely connected with the everted, thickened mucous membrane, a portion of which it is well to remove. Division should be made through it upon the line selected for excision, and a continuous row of double tendon sutures is rapidly made to encircle the base of the hæmorrhoidal plexus. It is then resected with scissors, and a light line of continued running sutures encloses the deeper layer, and when gently drawn upon, taken as advised, from within outward, are themselves buried, leaving no stitches in sight. Carefully dried and dusted with iodoform, the operation is completed by painting the line of closure with a layer of iodoform collodium. It is usually better that three or four days elapse before defecation ensues, after which there is little suffering. With the paralyzed muscle at rest, the conditions of the parts remaining aseptic, pain and œdema are almost entirely wanting, and the contrast between the suffering, and too often defective result, pertaining to the measures usually in vogue, is so marked, that I cannot help thinking that he who gives this operation a careful trial, will abandon all others for the cure of hæmorrhoids.

To resume, it will be seen that the above group of operations are based upon a tripod of simple factors:

First—Clean dissection in aseptic tissues, aseptically maintained.

Secondly—The restoration of the parts to their normal relations, by means of animal sutures, preferably tendon, aseptically buried, and the wounds protected from external contamination and infection, by the simplest possible methods of dressing.

Thirdly—Retention at rest.

The tissue, aseptically maintained and held at rest, for a few days only, take on repair without pain or suffering. The collodium seal is less satisfactory upon wounds of the mucous surfaces than upon the skin; however, it is surprising to note the rapid changes inductive to repair which go on in an aseptic wound, and to this end, external protection after a brief space of time is far less

important than was earlier supposed. In the light of great principles, founded upon scientific data, of practical value for the well-being of our race, personal questions sink into insignificance and are deservedly worthy to be forgotten. However, I trust it will not seem presuming, in claiming for myself the merit which I know a generous profession is willing to grant to all scientific measures which are deemed worthy of approval. The use of the buried animal suture seems almost as a corollary in the problem of aseptic wound treatment, especially when we take into account that the great principles upon which its adoption is based were clearly demonstrated by the immortal founder of antiseptic surgery. Mr. Lister traced with pains-taking fidelity the changes which ensue upon the closure of a great vessel by the animal ligature when aseptically applied. Indeed, these changes, when the tissues chanced to be aseptic, had been as clearly pointed out, and the results demonstrated, in the early part of the present century, by American surgeons, whose work is now well nigh forgotten, although deserving of a permanent place in the history of surgery. Dr. Jamison, a distinguished surgeon of Baltimore, published a prize essay in 1827, replete with demonstrations upon the lower animals, in which he follows with rare acumen the changes which ensue in the ligation of vessels in continuity, by the animal ligature. The material employed was, for the most part, narrow strips of deer skin tanned after the methods in use by the American Indians. The skin when finished being soft and pliable, somewhat resembled the chamois skin of commerce, although a very much tougher and stronger product. Dr. McDowell, the founder of ovariectomy, used such a ligature for tying off the pedicle in his first case of ovariectomy. The celebrated surgeons, Drs. Physick and Dorsey of Philadelphia, Dr. Nathan Smith of New Haven, and others, including Sir Astley Cooper of London, made use of such ligatures cut short and enclosed within the wound, and wrote approvingly of the results. Governed, however, by the theories of irritative conditions, inflammation and vascular changes which occurred in the tissues, all obscured by the want of accurate knowledge of aseptic processes, the practical lesson which these men taught was lost to surgery until a better pathology demonstrated the now well-defined lesson of septic and aseptic conditions which pertain to wounds. Directly after having received personal instruction from Mr. Lister in 1870, I operated upon a case of hernia, where the abdominal opening was so very large it became necessary to close it in order to retain its contents; this I did, although with much misgiving, by the use of interrupted sutures of cat-gut closed within the tissues. The wound was dressed antiseptically and primary union followed, with a permanent resulting cure of the hernia.

The lesson taught bore fruitage in a series of histological studies upon sutures buried in the tissues of different animals, killed at varying periods, after the introduction of the suture. The material used was primarily catgut, and afterward tendon taken from a variety of animals. I demonstrated that, little by little, the suture became infiltrated with new connective tissue cells which, in a very considerable degree, not alone surrounded, but replaced the buried suture. The limit of this paper prevents further detail, except a brief reference to my publications upon the subject.

My first case of operating, already referred to, occurred in February, 1871, and my first publication was in the *Boston Med. and Surg. Journal*, November 16, the same year. I have repeatedly called the attention of the profession to this subject, in various articles published from time to time until the present. So far as I am aware, the priority of my publications upon the various uses of the buried suture has never been questioned in America, but in Germany, I understand, such honor has generally been accorded to Werth, whose first contribution upon the subject was in 1876, five years after my first publication upon the subject. Experience in the hands of many operators has now carefully demonstrated the wide applicability of the buried animal suture, covering the entire field of operative surgery when aseptically applied, itself aseptic, in aseptic wounds. In such wounds, when the tissues are evenly coapted, drainage is no longer required, and any material left in the wound for the purpose, is not only superfluous, but positively detrimental and dangerous, since wounds thus closed, no matter how large, including even the major amputations, may be sealed with the germ-proof dressing, and all subsequent attention, beside retention at rest, is unnecessary.

POST-OPERATIVE PERITONITIS.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, Washington, D. C., May 5, 1891.

BY BENJ. T. SHIMWELL, M.D.,

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The object of this paper is to bring forward, for discussion, certain symptoms that follow after operations in the abdomen.

The value of proper drainage, in this class of work, is fully appreciated. Some operators being so enthusiastic as to enforce its use in almost every case. This enthusiasm deserves more commendation than condemnation.

The necessity that requires such means, is a result of the condition on which the title of this paper is based.

To properly understand the idea intended, there must be an appreciation of the distinctive differ-

ence between the two conditions, sapræmia and septicæmia. It is a state of sapræmia due to the absorption of a chemical product into the system.

The tendency of an injury to any closed serous cavity, is to result in an inflammation which will diffuse itself over its whole surface, unless there is contact and adhesions formed which limit its extent. It is this peculiarity that accounts for peritonitis following operations.

This is an asthenic inflammation. The difference between this and the sthenic is in the character of the exudation. This is explainable on the theory that there is alteration of the functional activity of the peritoneum, produced by the interference, resulting in the engorgement of the vessels and transudation of the serous contents. It is an inflammation which does not go beyond the first stage and its serous exudation. If it was to pass into the second, then we would have fibrin and cell elements present, forming adhesions constituting what the pathologists call the chronic stage.

The existence of a pure serous exudation is doubted by pathologists generally. They admit it does, but claim it contains fibrin in more or less quantity. If it is present it must be in its primary elements.

The seriousness of this effusion is entirely governed by the quantity: when slight, the peritoneal surface is able to remove it; if greater, then positive means must be used or death will occur.

The presence of this fluid is caused by involvement of the whole peritoneal surface.

The limitation of this condition is governed by the recuperative powers of the individual, and the influence the operation has on the system at large.

It is a congestion, with consequent exudation, due to paresis of the vessels. The development of germs is the secondary involvement, and on this depends the result.

We know that the peritoneal surface is able to take care of pyogenic organisms, providing the condition is such that their absorption may take place. Yet an abnormal state of this membrane or an abrasion may be sufficient to allow of their full development. Experiments have proved that saprophytic bacteria can be absorbed in large quantities, yet, if there is an interference in the functional activity of the peritoneum or the exudation be so increased as to interfere with rapid absorption, then sapræmia will occur. There will not be suppuration in these cases. This is a point in the argument. In this form of peritonitis absorption does take place, more or less rapidly at first, then extension of the condition interferes with the action of the lymphatics, and consequently there is partial stasis. This state being present, the pyogenic organisms existing develop and rapid intoxication results.

Retained blood clot, shreds of tissue, imperfect

coaptation and the exudation from denuded surfaces furnish means for the development of micro-organisms independent of any other condition. The effusion with development of germs, that is incited by the presence of these foreign substances, give rise to a state that is not of the character dealt with by this paper. It is septicæmia, not sapræmia.

To account for the presence of these micro-organisms is not my object. Whether they are introduced from without, excreted from the blood or derived from the intestinal canal, is an open question.

It is not scientific to say, because plasma and adhesions are not present, that this condition is not peritonitis; sufficient to the fact is the existence of this serous exudate.

We cannot overlook the fact of the localized peritonitis created by the interference, which exists in every case operated upon. No one will deny the fact that exudation takes place and that the absorptive power of the peritoneum is brought into play or relief is sought in the drainage tube.

I have had, in my experimental work on the dog, serous exudation occur after operations. The quantity varied in extent. Post-mortems would show the intestines congested and free of plasma. Mesentery always shortened. The point of operation showing plastic exudation, there being either good union or secondary softening of the exudate.

Pus was never present at any place in the abdomen but at the point of operation. It is therefore proof that the exudation was free from fibrin; for if not suppuration would have been more diffused. As fibrin and cell elements are necessary for suppurative change, it can readily be understood why this condition does not exist. If the exudation is thrown out on the serous surfaces there may be sufficient plasticity to maintain their contact, and fibrinous union occur. This is possible if there is modification of the conditions with absorption of the fluid, but if this persists the fibrinous network gives way. The effused leucocytes become fatty, degenerate, and suppuration follows.

How often have post-mortems shown the place of operation covered by adhesions, and yet a serous exudation in the pelvic cavity.

Why two operations will give diametrical results, when done under the same conditions, is difficult to explain.

Why a simple oöphorectomy will end fatally, and another, followed by necrosis of the stump and suppuration, terminate with discharge of ligature and recovery, is more easily explained. In one, necrosis has not occurred and inflammation extends according to the law of serous cavities. The other has necrosed, adhesions form, limitation of inflammation takes place and suppuration occurs.

The classical symptoms as recognized in peritonitis are absent, or modified, when present, and on these grounds do cases deceive.

A close observation of cases that have come under the writer's care, has convinced him of the existence of certain facts that are more or less constant. One of the most prominent symptoms of so-called idiopathic peritonitis is pain.

In post-operative peritonitis this symptom can truly be said not to exist. If present, it is very slight and is generally localized, being due to existing adhesions. It is apt to escape attention unless careful palpation of the abdomen is made.

Tympany exists in an exceedingly mild form. In some cases it is not apparent. This is in part due to contraction of the mesentery which holds the intestines close to the posterior wall. I have seen the liver dulness over two inches above its normal position by distensions of the transverse colon, and yet the abdominal wall was flaccid.

The temperature sheet, in the average case of this kind, shows nothing characteristic. Constancy is not present. Rise and fall making no change in the general condition. A gradual fall from 103° to 99° has neither cleared the cloudy sapræmic brain nor lessened restlessness. The rise again at unsuitable hours has not increased, nor changed the existing condition.

In these cases post-mortem shows nothing resembling the idiopathic form. Here, effusion of bloody serum is present, in variable quantities, situated in the pelvis, located there by gravity. Adhesions are not present, except localized by Nature's attempt to limit. There is not the diffused matted or attached intestines.

There is one sign in the diagnosis that I think is conclusive in forming an opinion. I have found it present in all forms of peritonitis. The so-called idiopathic, tuberculous and post-operative. It is the absence of Douglas' cul-de-sac as felt through the rectum. Every one who has examined many rectums knows, that when the finger is introduced to the anterior, that after passing beyond the internal sphincter there is felt a mass that has the sensation as if the rectal walls had prolapsed; this is always pushed aside and the continuation of the canal is followed. This mass is made by Douglas' cul-de-sac, which pushes the rectal wall downwards. If the rectum is examined, in a case of peritonitis, this mass will not be present; instead, the finger will turn about in space and have to be introduced farther into the bowel; in some cases pushing the anal surface upwards to reach the roof made by the floor of the sac. This is most marked in the male. I have been unable to feel the floor of the sac even when the abdomen was full of fluid and the belly walls excessively distended. This is due to the contraction of the mesentery, which draws up the rectum, obliterating in whole or part, the recto-uterine or recto-vesical space.

A REPORT OF THREE SUPRA-VAGINAL HYSTERECTOMIES AND SIMILAR CASES TREATED BY ELECTROLYSIS.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY THOMAS OPIE, M. D.,
OF BALTIMORE, MD.

Mrs. L., age 48, was married at 28. Menstruation began at 16. This function continued regularly, painlessly, normally, throughout her unmarried life and during her married life until six months ago, when she began to menstruate on alternate months. She never conceived during her 22 years of married life, though her husband was a healthy man and both enjoyed to the fullest extent the conditions of sexual union.

Five years ago, she first noticed an enlargement of the abdomen; she observed that she was "short-waisted." Pressure symptoms manifested themselves in disturbances of the digestive system two years ago and were her only annoyance, save the mortification growing out of her abdominal development.

There has been no vesical nor renal disturbance, at least so far as the patient remembers, because, like the uterus of advanced pregnancy, it has for five or six years been an occupant of the abdominal cavity.

The lady on her first visit to my office stated that she had been examined and an opinion obtained that she had an ovarian cystoma, but her friends were unalterably opposed to operative procedure.

The conditions of fluid contents were satisfactorily made out, but my indecision as to its exact character was manifested by my double equipment for the operation either as an ovarionomy or a hysterectomy.

After thorough aseptic, indeed absolute antiseptic preparation of the patient, operator and assistants, an incision was made from the ensiform cartilage to the symphysis pubis, a distance of 14 inches. The tumor was brought forward through the incision and Baker-Brown's clamp supplemented by two Koeberle scissors clamps were made to constrict the pedicle, which was the uterine neck. Despite this precaution hæmorrhage ensued, but was promptly arrested by seizing the vessels with artery forceps, ligaturing them and tying the pedicle in three sections, the middle one by the saddler's stitch.

The tumor weighed over 20 pounds, its antero-posterior circumference measured $23\frac{1}{2}$ inches, and its transverse circumference $22\frac{3}{4}$ inches. Its shape, lying upon the table, might be simulated by a bladder in the same position, three-fourths distended by water. The diameter from the pedicle to the fundus was 13 inches, the transverse

diameter 12 inches and the vertical diameter $9\frac{1}{2}$ inches. The intra-vaginal portion of the cervix was not enlarged, the body of the fundus apparently monopolized all the pathological elements.

The general outline of the tumor was the smooth hypertrophied and symmetrical appearance of the uterus of advanced pregnancy, in strong contrast with the irregular and nodular characteristics of the typical fibroid. The ovaries are both intact in the specimen and are located near the section of the stump, equi-distant from it and exactly opposite each other. There were absolutely no adhesive bands or other evidences of there having been at any time inflammatory trouble.

The microscope showed a large preponderance of fibrous tissue and that the numerous dilated lymph spaces were filled with fibrin. The fluid contents of the tumor coagulated immediately after its removal.

In pregnancy the development of the uterus out of the pelvis into the abdominal cavity, so as to make the woman "short-waisted," would take at least four and a half months. In a measure there is a parallelism between the normal and this so-called abnormal growth, since both are nutritive in their character, the one in the main muscular, and rapid, the other fibrous and slow. It is set forth in the history of this case that since it began its abdominal development, five years have elapsed and it had now attained the size of the uterus at full term. In view of the law of uterine development, we might assume that this fibroma had an intra-pelvic existence of at least five years, and therefore the whole period of growth was at least ten years.

The early stage of the tumor was even more mysterious and inscrutable, than the early stages of pregnancy. The patient informs us that her first and only intimation of her condition was, that she was getting "short-waisted."

A pertinent and practical question is, when did this cystic degeneration begin and what is its significance as bearing on the health and longevity of the patient?

The temperature has never risen since the day of operation above 99° , nor the pulse over 78. The Koeberle clamps, were removed on the second day, and the Baker-Brown clamp on the tenth day. The silk-worm-gut sutures with which the abdomen was closed, were removed on the twelfth day. The whole extent of the wound has been sealed by primary union, except the lower end of the incision corresponding with the stump of the pedicle which granulated healthily, the abdominal peritoneum being securely united to the peritoneum of the pedicle. I may say, at the time of this writing, the twelfth day, that with a sensible and manageable patient like the one in question, there is but one possible danger ahead, and of that we stand forewarned, viz.: ventral hernia.

Two years ago I met with a similar case of fibro-cystic myoma and operated at a private house with the same fortunate results as in the case just described. The lady recovered without a single untoward symptom and is now plying an active and successful mercantile business.

My third case of hysterectomy for a fibro-cystic myoma was performed 18 months since at a private residence. This patient died on the 6th day. While I cannot state positively the cause of death, since a post-mortem was refused, my belief is, she died from sepsis.

The length of the incisions in the last two cases referred to was about 12 inches and weight of each over 15 lbs.

The mode of operating in these cases is in dispute, though Keith, the most successful of all hysterectomists, advocates the extra-peritoneal plan, as do Pean, Hegar and Bantock, while Schroeder, Billroth and Koeberle, the author of the "serre nœud," practice the intra-peritoneal method.

It is not likely that any one will contend that ergot, administered by mouth or hypodermically, would in any wise curtail growths like the specimen I have described. The removal of the appendices would, if it was practicable in such huge growths, have but little if any influence. I have for two years past used electricity hopefully and for some time enthusiastically, in fibroids of all kinds.

The intra-uterine electrode, as well as the method of stabbing the tumor with the sharp platinum electrode, has been tried frequently and while the applications seemed to improve the general health of some cases, stopped hæmorrhages and greatly relieved dysmenorrhœal pain, I cannot claim to have dissolved any single fibroid or made even an arrest of growth of a cystic fibro-myoma. I caused an abdominal peritonitis by a puncture of a large fibroid through the abdominal wall, and have seen one case, where sepsis was caused by a physician, in the use of an intra-uterine electrode.

I have, at this time, under treatment two large fibro-myomata both of which have developed above the umbilicus; one has had about 80, the other 50 intra-uterine applications, one case has ceased to have hæmorrhages, both have improved in general health.

I recall the case of a fibroid, which I detected when as small as a pea, located on the anterior lip of the cervix. It was not only favorably located for ready application of the current, but for the easy recognition of changes in its size. In the last 18 months I have made 25 electrolytic applications to it. It has trebled its size despite my currents.

I may not be as expert with my batteries as others who are claiming so much for electricity in the solution of fibroids, but I insist that I have,

after over two years of persistent effort with a considerable amount of material, some justification for having lost my enthusiasm and even in being discouraged as to this so-called conservative plan of dealing with fibroid tumors, pyosalpinx, cystic ovaries and the like disorders, which in many cases march straight on to death, or what is worse, to chronic, hopeless invalidism.

The treatment of fibro-cystic myomata by electricity, is well nigh obsolete. Cases have been recorded where abscesses have resulted and ended fatally. Whether aspiration and drainage of such tumors in conjunction with electro-puncture will remove the dangers, is not yet proven.

As soon as fluctuation is determined in a fibroid, extirpation should be resorted to.

The rules of differentiation, the attendant dangers and the treatment of fibro-cystic myomata are the same as ovarian cystoma. Indeed, the operation of gastrotomy for tumors involving the uterus has been evolved out of the work of the ovariologist, in the last quarter of a century.

Whenever an ovariectomy is performed the equipment of an operator should embrace the additional instruments required in a hysterectomy.

A CASE IN OBSTETRICS, FOLLOWED FOR MONTHS BY A DAILY DISCHARGE OF OVER TWO QUARTS OF A WATERY FLUID THROUGH THE CERVICAL CANAL.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY JOHN HAMMOND BRADSHAW, M.D.,
OF ORANGE, N. J.

On December 9th, 1890, a colored woman, aged 34, was confined at the close of her seventh pregnancy. She had borne three girls alive and easily, and three boys, two dead, and all with great difficulty. Finding a face presentation, apodalic version was performed, but not before two ineffectual attempts with the forceps had been made. The child was a male, weighing 12½ pounds, with a large ossified head. It was dead. The woman had been in labor two hours. After the birth of the placenta, there was an unusual amount of hæmorrhage, and the patient went into a condition bordering upon collapse. The extremities were bandaged and ligated, and whisky was administered with digitalis by hypodermic injection. Two quarts of a hot corrosive sublimate solution 1-3000 were thrown into the uterus, the hand carrying the nozzle of the syringe to the very fundus. There were no new lacerations to be discovered, and the patient made a fair convalescence without much pain and with but little elevation of temperature. Three weeks

after delivery the patient was seen because of a flow of water that came from the vagina, wetting the bed and everything upon which she was placed. Fearing the existence of a vesico-vaginal fistula, the patient was carefully examined with a speculum. The vaginal wall was intact and a watery discharge could be distinctly observed, coming through the cervix, which was badly lacerated. The probe passed only into the uterus. At the suggestion of Dr. William Pierson, a pint of a colored solution was injected into the bladder. But as none came through the cervix, the patient, after a few minutes, passed the entire quantity again *per urethram*. As the patient's life was made miserable by the constant wetting, one of Jay's urine bags was inserted into the vagina to catch the fluid that came so copiously through the cervical canal. During the first twenty-four hours this caught just eighty ounces of a clear, colorless fluid, of no smell, a slight cloudy sediment on standing, sp. gr. 1001, alkaline reaction and slightly albuminous. Microscopically, there were found pus cells, granular detritus, a few large, epithelial cells and fibrin. The patient had voided in this time 18 ounces of urine of a rich amber yellow, sp. gr. 1018, acid in reaction, and with normal appearance under the microscope.

An examination of the patient revealed nothing in the pelvis or abdomen out of the way. The patient had never been seen by the writer before her accouchement; she had herself never observed or felt any swelling or abdominal tumor; she had never had a large abdomen.

During December, January and February the patient passed daily through the cervical canal, actually, over two quarts of this colorless fluid. Her appetite and general health was fairly good; she gained in weight and flesh; there was never any distention of the abdomen. But the patient was an invalid—she could do no work, and lay on her bed most of the time. Consultations were held, and Drs. Ill, Pierson, Harvey, Graves and Stickler saw and examined the patient.

During several of the examinations a probe was passed apparently through the fundus of the uterus into the abdominal cavity. It entered easily and without force, almost to a limitless extent (at least its entire length and that of its handle), while its point could be felt close under its abdominal wall above the umbilicus.

For three months she passed about two quarts of this colorless fluid through the uterus. At the end of this time the patient was given $\frac{1}{2}$ grain codeia every three hours, with the hope that it might diminish the flow. This it speedily did, and in two weeks time the patient removed her Jay bag, as she passed but a few drops of the fluid per day. The codeia made her very drowsy at first and some constipated, but not so much so but that an enema would give relief. The codeia

was then stopped, whereat the discharge began again, but only to the extent of four to sixteen ounces a day. At this time Dr. Howard A. Kelly saw the patient in consultation.

At the present time, just six months from her confinement, the patient, provided she keeps still, passes little or no fluid. If she walks about she voids from two ounces to a pint a day. She still takes the codeia, but at intervals of several days, and then only if she has pain or if the discharge of fluid is profuse.

The writer has purposely refrained until now from giving any definite diagnosis that will explain the source of the discharge. There has been a difference of opinion. After watching and studying the case for a long time I affirm that this fluid comes from the peritoneal cavity and is generated by the peritoneum. By the majority of those that have seen the woman it is held that an opening exists in the uterine wall, making a free communication with the peritoneal cavity. It is hoped that if any are present who have seen and examined the woman that they, as well as others, will express their views.

The patient remains an invalid. Can an operation or any other kind of treatment relieve her of her affliction?

THE USE OF VAGINAL TAMPONS.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-Second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5, 1891.

WILLIAM A. B. SELLMAN, M. D.,
OF BALTIMORE, MD.

I am extremely doubtful whether I have selected a proper title for the paper which I have the honor of presenting to this section.

The placing of cotton or materials of similar nature in the vagina is termed tamponade, where a small amount is placed in the canal for purposes other than hæmostatic. Tampon signifies the complete packing of the vagina to stop or avoid uterine hæmorrhage.

I use the word tampon in its broadest sense to denote placing of cotton, jute, etc., in small or large quantities, either for hæmostatic purposes or as a means of placing drugs against the cervix uteri, or as a preventive to the escape of liquids we have applied within the uterus to prevent them passing down and irritating the external genitals. Most gynecologists, when they treat their patients in the office, apply a pledget of cotton against the cervix to prevent the irritating agents employed in the treatment of the case from escaping and excoriating the external genitals during the journey to their homes.

I do not propose to add to the present knowledge in regard to the beneficial action exerted by the applications made on these tampons, or enlarge upon the good results obtained by their

use as a means of supporting displaced organs. Neither do I intend to tell you how to make them, or introduce or remove vaginal tampons; you are thoroughly experienced in all these matters. I rather intend to convey in this paper my impressions of the dangers attending the use of tampons, and I will also endeavor to prove that on many occasions when we think that we have applied them in a scientific manner, that it has been improperly done, and carried out in a manner that will do much harm to our patient, and, perhaps, develop injuries that may require months of treatment to overcome.

In the first place I declare that vaginal tampons introduced for hæmostatic purposes are seldom required, and when used are likely to be attended or followed by great injury to our patient. I make this exception, the use of the tampon for the purpose of provoking uterine contractions and softening of the cervix in cases where we desire to bring on premature labor, as for example, cases of placenta prævia. The packing of the vagina is sometimes justifiable in cases of hæmorrhage due to the presence of uterine fibroids.

I do, however, object to the indiscriminate use of tampons to control uterine hæmorrhages. Examine and find out what has caused and is keeping up the hæmorrhage; remove the cause and the flow will cease. Many a woman has had tampons placed in the vagina where the hæmorrhage has been due, either to retained placental shreds, or perhaps to fungosities existing on the uterine walls. The use of the curette will remove the cause and the flow will cease. If you use the tampon in cases of this nature, the collection of blood, etc., will finally distend the cavity of the uterus, and perhaps dilate the opening into the Fallopian tube, frequently expanding this canal, and the fluid passes into the abdominal or peritoneal cavity. In a practice extending over a period of twenty years I have never seen a case where I have found it absolutely necessary to tampon to relieve uterine hæmorrhage. I have invariably sought for the cause and gave local treatment or removed it.

Dr. Mundè says, "Every practitioner who takes, and is liable to meet with, cases of uterine hæmorrhage, from miscarriage, polypi, polypoid endometritis, fibroid uterus, or cancer, should not only possess a Sims' speculum, but know how to use it and how to tampon the vagina so securely that not a drop can escape so long as the tampon is retained."

I take exception to this teaching and think that it is likely to mislead and be productive of great mischief to the general practitioner, and the medical man starting out in his professional career dependent upon the advice and experience of his teachers to guide him in the treatment of this class of cases. He is likely to feel too safe

so long as he perceives no oozing by the side of his packing, and loses sight of what may be taking place internally. Even in hæmorrhage occurring during the progress of cancer of the cervix it is unsafe to tampon. It is far better to apply a hæmostatic agent directly to the bleeding surface by means of applicator or syringe.

The presence of tampons in the vagina interferes with the evacuation of the bladder and with the proper emptying of the rectum.

In cases of profuse hæmorrhage I frequently have it suggested to me to pack the vagina until the patient has recovered from the prostration due to the loss of blood; when she is stronger you can remove the cause. I consider this bad reasoning. If you are called to see a case of profuse hæmorrhage from the nose (epistaxis), due to the presence of a nasal polypus, you certainly would not plug the nostrils, you would remove the growth and thus check the hæmorrhage.

There are cases where the hæmorrhage comes from the walls of the vagina where the application of the tampon is justifiable, for the pressure of the packing controls the loss of blood by compression of the bleeding vessels.

Tampons are responsible for the production of serious inflammatory conditions of the uterine adnexa, peritoneum and cellular tissue.

After an application of iodine, iodide of potash, nitrate of silver, sub-sul. of iron, etc., a tampon is frequently introduced in the vagina to prevent excoriation of the external genitals by the fluid flowing out of the vaginal outlet. Sometimes it is a small pledget or thin layer of absorbent cotton wet with glycerine or medicated with borax, lead, or tannin. At other times a larger piece is introduced, forming a vaginal plug. The result is the same in both instances. The secretion in the cavity of the uterus is increased by the agents employed for the application; the cotton placed against the cervix uteri completely prevents the escape into the vaginal canal; the result is distension of the cavity of the uterus by the fluid exuding from its walls, this is accompanied by pain, a sensation of fullness within the uterus, what we term uterine colic. This distension may continue until the fundus is dilated, the opening into the Fallopian tube allows the uterine secretions to pass into the tubes; at times the fluid may distend the entire tube and the secretions pass into the abdominal cavity, setting up inflammation at this point. Very fortunately for our patient, on many occasions after a moderate amount of distension has taken place, the accumulation forces the tampon to one side and the fluid is discharged by the vagina.

In this way I account for the violent pains following intra-uterine applications, even of a mild character, when we have placed the vaginal tampon for the purpose of cleanliness.

When we remember the effect of applying these agents to the mucous membrane lining the nostrils, the free secretion provoked lasting in many cases for twenty to forty hours, we can appreciate the amount of fluid thrown out from the uterine mucous membrane after applications of similar nature.

There is a class of cases having a profuse discharge from the endometrium, the characteristic glairy, white of egg mucus; some physicians treat these cases by merely placing a pledget of medicated cotton against the cervix uteri. This tampon effectually prevents all discharge from passing out of the uterine canal, the cavity becomes distended, the purulent secretion may pass into the Fallopian tubes, setting up a similar inflammatory condition in their mucous membrane as already exists in the walls of the uterus. The tampon under these conditions is dangerous, is productive of great mischief applied in this manner. Many a woman has had gonorrhœal inflammation forced from the vagina and lower portion of the uterine canal into the Fallopian tube by having a tampon placed in the vagina. I make it a rule never to apply a tampon in specific vaginitis.

I am extremely doubtful of the propriety of the use of tampons placed against the cervix in cases of epithelioma or cancer of the cervix uteri.

It has been suggested that we use tampons in cases of inflammation of the ovaries and the Fallopian tubes; the idea advanced is that the tampon supports the uterus and prevents the organ from dragging and exerting traction upon the uterine adnexa. The danger of using these tampons is that suppuration may take place whilst the tampon is in position, the purulent secretion will pass into the cavity of the uterus and will be prevented from passing out by the presence of the vaginal tampon, and may be forced back into the peritoneal cavity, lighting up inflammation at that point.

The treatment of inflammatory conditions of the cervix and uterine body by vaginal tampons, as suggested by Dr. Engleman, has not accomplished the good results we expected when the treatment was advised by that illustrious gynecologist. One reason of failure, I think, is this one point that I dwell upon with so much earnestness, that is, the discharges are prevented from flowing out of the cavity of the uterus.

In conclusion, I would advise the application of tampons only under the following conditions:

In office practice, after making an application to the endometrium, if the agent employed is likely to flow down and excoriate the external genitals, I place a very thin pledget of absorbent cotton lightly against the cervix; this will absorb the secretions; I tell my patient to remove it immediately upon her arrival home.

In cases of prolapse of the uterus, where there is no uterine catarrh, using it as a pessary. Also in cases of prolapse of the vaginal walls under similar conditions.

After plastic operations upon the vaginal walls where there is no danger of hæmorrhage taking place above the point where the tampon has been placed.

In cases of hyperplasia with little or scanty secretion from the endometrium, I frequently place a small pledget against the cervix uteri; this may be medicated with glycerine, boroglyceride, glycerate of lead, etc.

The application of tampons to correct displacements of the ante- or retro-character is very unreliable. It is so difficult to place the pledgets so as to avoid increasing the displacement. Besides, the pressure of the tampon often interferes with the circulation in the pelvis. I have frequently had patients complaining of pain located in the hip or down one leg after the application of a tampon or tampons.

NON-SURGICAL TREATMENT OF CANCEROUS UTERI.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY C. R. REED, M.D.,
OF MIDDLEPORT, O.

It is not the purpose of this paper to condemn the surgical treatment of cancer of the uterus; nor would the writer claim that a majority of the malignant diseases of that organ should be treated by medicine alone, for he admits that cancer anywhere should be treated, when practicable, by local remedies, and that general medication has little or no influence over the disease, and the vaunted specific he would only mention to condemn. The proposition to treat cancer with the curette and local applications would appear absurd after reading the above title of the paper, yet the paradox will seem logical, as we proceed to illustrate our position.

The non-surgical treatment of cancerous uteri is the disuse of the scalpel or knife, as unnecessary, in many cases; while probably a majority of cases, when first seen by the physician, require the total extirpation of the diseased organs, but it is not in the interest of medical science or suffering woman, to treat all cases of uterine cancer, at once, by what is called the radical operation. The writer pursued this course several years, telling the patient and her friends that there was nothing to be done for her but total extirpation of the cervix, at least, and better that the whole organ be removed; and as she would not follow this advice, he obstinately refused to do anything, and telling her and friends to let her die if she wished—which she usually did. He has

since concluded that he made a mistake, that a dangerous surgical operation is not always necessary, and that his declaration and acts were not always in the interests of the patient and humanity, nor the science and art of medicine and surgery. If the suffering woman refuses to submit to the knife, of which most all of us have a dread, and is willing to undergo the more painful, but less dangerous, use of the curette and the cautery, she certainly has a right to her choice, and the physician should, frequently, gracefully acquiesce. It may be claimed that this is surgical treatment. Call it minor surgery, if you please—she and her friends have a right to choose it, they taking the responsibility of the result. There are many other diseases to which women, and men also, are subject, which would best be treated by surgical operations to which they often will not submit, but they should not be abandoned to fate, if they can be cured or relieved by less objectionable means.

The prejudice against surgical operations is innate in the human race, and cannot be eradicated, and it becomes necessary to devise other means of treatment, which may often, at least, attain the same end. The woman should not be subjected to a dangerous operation if she can be cured or relieved by means less fatal. That the removal of the uterus, by any of the means recently devised, is frequently fatal, no one will deny; that cancerous uteri can be arrested in its progress, and often cured, by local treatment attended with little or no danger to life, is a well established fact. The purpose of this paper being to give the result of my own observations, I will quote but a single paragraph from authorities on the subject. In his late work on Diseases of Women, A. J. C. Skene, of Brooklyn, in speaking of treatment of cancer of the uterus, says: "A thorough curetting, followed by powerful caustics, will frequently arrest the progress of the disease."

Mrs. F., aged 60, mother of several healthy children, had passed the menopause ten years since, and had enjoyed good health until early in 1889, when she observed a red flow which at times was profuse, and rapidly destroyed her strength; she also had pelvic pain, and when the hæmorrhage was slight she had a profuse watery discharge, which had the odor characteristic of malignant disease. During 1889 she gradually lost strength and flesh, and spent most of the time in bed. She was attended alternately by two physicians, members of this Association, who had persistently kept from her the true nature of her disease. Not receiving any apparent permanent benefit from the treatment, which was both general and local, and not understanding why she did not get better, she discharged her attending physicians and sought my advice, and I first saw her February 4, 1890. I found her in bed,

unable to sit up but little, emaciated, and the cancerous cachexia well marked, and to relieve her suffering she had contracted the morphine habit, with all its dire results. I should have said her parents were living, each about 90, and she had been a widow some twenty years. On a tactile examination I found a carcinomatous cervix, patulous, and that characteristic feel as when you poke your finger into the nozzle of a shotgun. There were also several nodules which felt like large shot in the posterior part of the vagina. The examination caused hæmorrhage, and on expanding the blades of a bivalve speculum, it was so profuse that I felt relieved when I secured its arrest by applying the pure persulphate of iron.

She was told the nature of her disease, the prognosis of such cases, and was advised to undergo the removal of the diseased organ. This she firmly and pleasantly declined, believing she would not live through the operation, and I did not urge it, as I was of the same opinion. She implored me to do what I could to prolong her life; she wanted to live until her parents passed away, and asked that the attacks of hæmorrhage which she so much dreaded be arrested. I did not think that the body of the uterus or its appendages were involved, and had some hopes that temporary relief might result from active local treatment. She lived in an adjoining State, and I visited her once a week, and each time used the sharp curette, followed by the pure chromic acid. I prepared a swab of absorbent cotton, as large as would pass into the cervical canal after I had rapidly reamed it out with the curette, and on withdrawing the latter, immediately dipped the swab into water, then into the dry chromic acid, and carried it as far as possible into the cervix and cavity, and held it there until the hissing and smoke ceased, then withdrew the swab, packed the cervix with cotton saturated with the pure persulphate, which was directed to be removed by a string attached for that purpose, in three or four days. The hæmorrhage from the use of the curette would be fearful, but immediately stopped on contact of the chromic acid. She was directed to let me know should hæmorrhage occur in the intervals of my visits, and but once did she send for me.

When I left home a year ago to attend the meeting of this Association at Nashville, I arranged with a physician near her to apply the treatment in my absence. This was continued regularly for several months, the hæmorrhage ceasing, the local symptoms disappearing, the general health improving, flesh, strength and color returning, and when I left home in October last for a several weeks' visit in the West, I had no forebodings in regard to her case, and when I saw her in November I found her doing her work, apparently well and happy, with scarcely a trace

of her former disease on examination. I have not seen her for several months, though frequently in sight of her house, and learn that she is apparently well. I commenced the treatment of this case with a mental prognosis that it would end fatally in from four to six months—but during a professional life of nearly forty years I have attended no case that the treatment gave me more satisfaction than this, and I have the still greater pleasure of the assurance that the treatment at no time and in no way imperiled her life.

Will the same treatment be generally successful in similar cases? This can only be determined on trial. Could the treatment be as well carried out during menstrual life? Probably not. Will the apparent cure in this case be permanent? Of this I will not affirm, neither can it be foretold of the cases in which the radical operation of entire removal has been done.

It would not be consistent with the intended limits of this paper to give other cases in detail, and had no other cases come under my observation with a similar result, and no case in the literature on the subject, this alone would be sufficient to induce me to use the same or similar treatment before resorting to the operation of removal of the entire organ and appendages, with the present mortality attending the radical operation.

ON THE USES OF COCAINE IN GYNECOLOGICAL SURGERY.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D.C., May, 1891.

BY WM. H. HUMISTON, M.D.,
OF CLEVELAND, OHIO.

I have had an experience in the use of cocaine in gynecological operations during the past three years that has been eminently satisfactory, and I purpose in as few words as possible to lay the method and my experience before you.

I will first describe the manner of its use in dilating and curetting. Ten minutes before using the cocaine I give a tablespoonful of whisky or brandy. Place patient in the left lateral position, and with Sim's speculum expose the cervix—steady the uterus with a tenaculum inserted in anterior lip. Then take a hypodermic syringe with a fine needle, filled with a 4 per cent. solution of cocaine, which has two minims of pure phenol in each half-ounce of solution, and inject five minims into the posterior lip—wait two minutes, then secure a firm hold with bullet forceps, which will be painless. Proceed and inject in several portions of the cervical canal an amount equal to about twenty minims. I now commence my dilation, with the graduated hard rubber dilators until the cervix is sufficiently dilated to permit the entrance of the

intra-uterine syringe, when ten minims of a 10 per cent. solution is inserted into the uterine cavity. Continue at once with the dilating of the cervix until you have it completed to the extent desired, and then thoroughly curette the entire uterine cavity. This can be done with a slight degree of pain, and in many cases with none at all. I have not given an anæsthetic, other than just described, in dilating or curetting, during the past three years, and the cases include many primiparæ.

For the operation of trachelorrhaphy you can use cocaine and have absolutely a painless operation. Inject the angle, and the sides that you desire to freshen, or a wedge-shaped piece that must come away, and you can complete it all without the patient making a complaint. You will rarely require to use over one-half drachm of a 4 per cent. solution.

For restoration of the perineum in the majority of cases I adopt the split-flap method, and with one puncture of the hypodermic needle in the median line I anæsthetize the whole field of operation, and use only from thirty to forty minims of a 4 per cent. solution.

The hour for operating is usually 9 o'clock in the morning. The patient omits breakfast, and ten or fifteen minutes before the operation the alcoholic stimulant is given.

I say to the nervous timid patients, who are afraid that without chloroform, or ether, that their suffering will be great, that I will stop at any time that they say that they are suffering pain, and give them chloroform. This secures their confidence, allays their fears, and I have yet to hear the first request for another form of anæsthetic.

With this method we avoid the frequent and prolonged nausea and vomiting that occurs after the administration of chloroform or ether. The patients, with but few exceptions, relish their dinner, and their progress towards recovery is rapid and satisfactory. Had chloroform been given, and been followed with persistent vomiting, that so frequently occurs, the whole success of the operation, especially if it be for the restoration of the perineum, would be in jeopardy.

Quite frequently I find patients who are very sensitive, and very small doses will induce short and sighing respiration, together with peculiar sensations in præcordia, accompanied by great anxiety. Stimulants, promptly administered, control this very quickly and all unfavorable symptoms subside.

Twice I have dilated the urethra for fissure and irritable caruncula with but slight suffering, and a satisfactory result was obtained.

I assisted in one case of Alexander's operation where cocaine was used, but two grains in all, one grain injected on each side at intervals of one-half hour. While this was not painless the pa-

tient complained but very little, and withstood the operation well, with no bad after symptoms.

I have selected the following case as one of interest not only for its multiple operations, but to demonstrate the capabilities of cocaine as a local anæsthetic under a prolonged operation. The operations of trachelorrhaphy, anterior and posterior colporrhaphy and perineorrhaphy, at one sitting with cocaine for an anæsthetic:

Mrs. L., aged 39, married nineteen years, two children, youngest 10 years old, came first to consult me in November, 1888, complained of constant backache, very nervous, forgetful, bearing down sensation, felt "as if everything would fall out," to use patient's own language, leucorrhœa, frequent micturition and headache. Patient presented the appearance of a sufferer, pale, sallow complexion, dark lines under her eyes, and quite a degree of prostration. On vaginal examination I found a partial laceration of perineum, os uteri large, swollen, tender and lacerated, edges everted and granular—thick, tenacious secretion in abundance in cervical canal. Uterus prolapsed, body large, tender. Ovaries swollen and very sensitive. Cavity of uterus measured three and one-half inches. Upon directing the patient to strain down the anterior and posterior walls of the vagina bulged forth separating the labiæ. The vaginal walls were hypertrophied and relaxed. Patient was treated locally at my office every third day for two months. Treatment consisted in removing the secretion from cervical canal. Application of iodine and glycerine—scarification—tampons of glycerine, and boracic acid. To be followed at home with copious injections of hot alkaline water. The swollen congested condition was markedly diminished and patient steadily improved until January 10, when patient entered my private hospital for operation. Curetting was done January 11, and the granular hypertrophied endometrium removed and Monsell's solution of iron thoroughly applied to the uterine cavity. This was all accomplished with but little pain after the method previously described. For the next two weeks patient's temperature varied from $97\frac{3}{8}$ to $98\frac{3}{8}$. Patient was kept quiet in bed and after the first week, tampons of iodine and glycerine were applied daily. January 27, uterine cavity measured three inches. Position of uterus higher, and has felt relief from all symptoms complained of. As there was no appreciable pelvic exudate, or signs of remaining inflammation, I decided to make as many of the operations at one sitting as possible; gave patient one-half ounce of whisky. The cervix being lacerated bi-laterally, I made the double operation, first injecting fifteen minims of cocaine in the space I wished to denude. I generally use Skene's hawk-bill scissors to freshen the angles, as it thoroughly removes the tissues from the

whole angle. After preparing my flaps on both sides I united the edges with silver wire sutures, using the spiral coil and shot fastener. Patient complained of but very little pain, and when asked if she could endure more, she replied, "Yes, go ahead." I now exposed the anterior vaginal wall, and injected twenty minims of a 4 per cent. solution, and removed in one body an oval-shaped piece of mucous membrane extending from within three-fourths of an inch of the cervix down for two and one-half inches. This was brought together and united with a deep and superficial continued suture of cat-gut. Some five minutes after this second injection of cocaine the patient complained of dryness of the mouth and fauces, and had some irregular breathing. Another one-half ounce of whisky was given, and soon she was comfortable, and requested to have everything done at once if she kept feeling as well as she was at the present time. The posterior vaginal wall was exposed after Martin's method, and the mucous membrane to be removed was injected in the same manner and amount as the anterior wall; waited five minutes and began removing the portion mapped out; again the patient complained of the dryness of her mouth, and the breathing became short and labored. Whisky was again administered and in a short time the unpleasant sensation subsided. A deep and superficial continued suture of cat-gut was here used, and the edges carefully and evenly brought together down to the line where it was to join the upper angle of the denudation for the restoration of the perineum. At several points in taking the stitches the patient complained of pain, but not sufficient to call for more cocaine. Two drachms of whisky were now administered, and the surface to be denuded for the restoration of the perineum was injected, using again twenty minims of a 4 per cent. solution. After waiting a few minutes I commenced to denude the surface mapped out; no pain complained of, but the former unpleasant symptoms returned, and a little more stimulant was given. The perineum was united with silk-worm gut, using a long-handled needle to put them in. In penetrating the edges near the skin, patient complained of the pain being quite severe, but I did not wish to use any more cocaine, and she endured it with but little complaint or moving. The stitches were tied and the whole time consumed in making the four operation: was one hour and forty-five minutes, and seventy-five minims of a four per cent. solution of cocaine had been used, equal to 3 grains. The patient's knees were bound together, and she was placed in bed on her side. A 2-grain suppository of svapnia was given per rectum. The temperature remained absolutely normal for two days, after which it rose to $99\frac{1}{8}$; the fourth day it was $99\frac{2}{8}$, the highest point

reached, then fell to normal, and remained so during the whole recovery. She was catheterized twice daily for two days, after which voided her urine as usual. The vestibule was well washed with boracic acid solution after each urination. Bowels were moved on the fifth day. The parts were handled as little as could be, and patient kept absolutely quiet. The sutures in perineum were removed the seventh day, and union was perfect. On the 27th day the sutures from the cervix were removed and union everywhere found perfect. No vomiting occurred. This I regard as a severe test for cocaine, and will, I feel, result in removing the great fear arising from the necessity for taking ether or chloroform in order to have these operations performed.

Strict asepsis must be attained in order to have these operations unite and heal readily without inflammation.

LAPARO-HYSTERORRHAPHY—AS A MEANS OF CURE OF CASES OF EXTREME PROLAPSE, OR RE- TRO DISPLACEMENT OF THE UTERUS.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, at Washington, D. C., May, 1891.

BY W. J. ASDALE, M.D.,
OF PITTSBURGH, PA.

We believe we shall encounter but trifling controversy in asserting that the mechanical treatment of uterine prolapses and displacements has proven to be entirely inadequate to cure, in by far the greater number of cases.

It is safe, too, to declare that the best adapted pessary—while promising palliation only, and not cure—is liable itself to become a nuisance; and not infrequently does beget for the wearer conditions much worse than the former states.

Finally, for a number, including nearly all of the cases of extreme prolapse, and all of the cases of marked retro-displacement with incarceration of the uterus, the use of a pessary or any mechanical support cannot be tolerated: for such, at least—a minority of all, but comprising a large per cent. of the whole—surgical methods must, unavoidably, intervene.

Contraction of the calibre of the vaginal tube, by surgical procedure, by any method whatever, as a means of recovery of the prolapsed womb—no matter how carefully performed, nor how extensive the section, must often fail of permanent good results; this plan, besides, is objectionable for reasons arising out of the social state.

Shortening of the round ligaments, as a method of permanent restoration of the prolapsed or otherwise mal-posed uterus, has not, in the experience of the writer, provided favorable results,

and, employed alone, we unhesitatingly affirm, will often be found inefficient.

Operation by vaginal suture taken through the uterus is inapplicable to many of the examples of displacement, certainly in all of those in which extreme flexion exists, with the womb bound by firm adhesions to the bottom or posterior wall of the cul-de-sac.

In all cases in which retro-deviations are coupled with fixation of the uterus by exudate-membranes, any treatment, to become effective, must include, primarily, the solution of the confining bands.

In the less aggravated cases of the chronic class much may be accomplished often—at first, preferably, through depletion; by punctures or scarification, the employment of glycerine-tampons, iodine and the hot douche; finally, and chiefly, by the prolonged, regular, continuous and careful application of vaginal packings, in the knee-chest posture—using wool-pledgets instead of cotton. Forcible taxis, under anæsthesia, should be employed, in suitable cases, repeatedly, in effort to release the adherent uterus, where the ordinary treatment has failed.

All attempts at solution or rupture of adhesions by indirect methods must, for a considerable number of cases, result in failure; for these, to succeed, the peritoneal cavity must be entered. Abdominal section being for the purpose made, rectifying ventral suture of the uterus, or through, or over its ligaments, is the natural and justifiable sequence.

Here, venturing to assert that ventral fixation of the uterus, in those cases where section of the abdominal wall is a preliminary, is not more hazardous—where proper precautions are observed—than suture, blindly taken, without section, by any of the other methods yet proposed—there remains to be particularly noticed, that a special and very material advantage concerning the final results, is gained by exposure of the pelvic contents to ocular and direct digital inspection. Every operator of much experience can recount a number of instances where, unexpectedly, an occluded and dilated, or distorted and adherent tube, presented, or an invested or diseased ovary. Neglect of like complicating conditions, in operations for prolapse or displacement of the uterus, must, necessarily, most seriously embarrass, often, perhaps, defeat the legitimate results of treatment.

The following cases—all that have been subjected, specially, to treatment for prolapse or displacement, by ventral fixation of the uterus after abdominal section, at the hands of the writer—are reported as contributing in some degree to determine the management appropriate to those of severe sort of their class:

Case 1.—Mrs. F., age 43; widow; multiparous; residence Pittsburgh. When first seen the

swollen and hypertrophied organ rested in complete prolapse between the thighs, exposed mucous surface extensively abraded; condition has existed for eight years; has "not been able to wear any supporter" in the vagina for a long time, because every such trial made her worse. Suffers from all the usual attendant miseries: headache, backache and aching of lower limbs; profuse menstrual and leucorrhœal discharge; vesical and rectal tenesmus, etc.

The uterus being reposit, the tubes were found sacculated and ovaries abnormally sensitive. Castration and hysterorrhaphy were proposed and accepted. After due preparatory treatment operation done May 23, 1889, in presence of and assisted by Drs. Cameron and Sands. Short medium incision. Appendages removed. A single, medium, silver wire suture, carried deeply into anterior wall over body of uterus, bringing uterus and wall into relation at highest possible point; the ends of wire separately armed and carried out through wall on right and on left at lowest part of incision; wounding of bladder avoided; a double catgut ligature was carried through each of the broad ligaments close to the stumps, and passing directly out through abdominal wall. Were tied down at the surface over sections of small rubber tube; the exposed peritoneal surfaces were abraded by lightly scraping with curette, when the wire suture was secured by twisting; incision closed throughout by silver sutures; powdered boracic acid dusted over site of incision and sutures; dry dressing and bandages. The womb suture (silver) was removed on tenth day after—catgut sutures earlier. Wool tampon with boro-glyceride was employed for a time in vagina. Patient's recovery prompt. Visited on May 1, 1891. Mrs F. says: "I am about 25 pounds heavier than at the time of operation, and in better health than at any time before, since my baby was born, over eight years ago. My womb has never come down since the operation, and I suffer from no pain and no annoyance whatever. I do my own housework and washings, now, something I was not for a long while before able to do."

Case 2—Mrs. J. J. W., age 24; nulliparous; residence, Pittsburgh; married 5 years; suffered since before marriage; has very constant backache and pains in lower limbs, and headache; all her pains greatly intensified at every menstrual occasion. Examination shows uterus to be strongly retro-fixed and confined in that position. Patient was treated regularly for almost one year, by the writer, by vaginal packing, also by taxis under ether, and without material improvement. Laparotomy and division of adhesions with suture of womb to anterior wall proposed and accomplished by operation, June 3, 1889. Present, Drs. Emmerling, Sr. and Jr., Prof. Dunn and Dr. Cameron, assisting. Uterus practically excavated

from the rectal pouch; its entire posterior surface bloody from the oozing in consequence of its detachment; bleeding points seared; tubes adherent and occluded at ostia externum, and fimbriæ inverted; tubes were set free and mouths teased open by fingers of operator; ovaries buried in exudate, uncovered without mutilation; no removal of parts. Two silver sutures in womb and through wall; catgut sutures passed to include round ligaments and tied down at surface of abdomen, right and left, as before, over sections of rubber tube. Bladder uninjured in operation; peritoneal surfaces abraded; womb sutures twisted, and incision closed; boracic acid sifted, dry, over site of operation; antiseptic gauze and bandage applied. All sutures removed in ten days. Patient's recovery uninterrupted. The normal position which the womb was made to assume by the operation is since perfectly preserved. This lady, Mrs. W., was last seen by me on May 2, 1891. She was found at her home and her husband's place of business—a busy woman in a bustling restaurant in the city of Pittsburgh—in the kitchen, where she stated she superintended all the cooking, and from very early in the morning until late at night, and daily, and thrived, notwithstanding hard work. She said: "I am well, first-rate; I have no aches nor pains. I change regularly, and without any pain."

Case 3—Mrs. L., aged 47; primip.; residence, Pittsburgh; suffered more or less severely since soon after the birth of her child over eight years ago; especially from lumbar pains; headache, and gastric and intestinal symptoms. Uterus retroflexed.

Operation Feb. 4, 1890; medium incision; right ovary a bunch of small cysts; removed right ovary and its tube. Rectified position of womb and secured same by two silver sutures, taken through womb and wall as in previous cases; catgut sutures, laterally as before described. The sutures were removed in the usual time, but suppuration in the suture tracks occurred; and, eventually, through a fistulous opening which persisted in the right wall, the ligature placed at stump of ovary, escaped. The normal position of the uterus is maintained by that organ. Mrs. L. was interviewed on April 30, 1891. She said: "I have gained in weight, and I do not suffer with my head at all, as formerly; in this respect I am a great deal better—otherwise I cannot say that I have gained. I am regular."

Case 4.—Mrs. J. H. L., æt. 28; primiparous; residence Allegheny; has a very deep bi-lateral laceration of cervix uteri; relaxation of vaginal outlet and complete prolapsus uteri; has been over three years in present state. May, 1890, operated for restoration of cervix and vaginal walls. Result: September 22, 1890; complete and thoroughly satisfactory repair of cervix and ample closure of vulvar opening, but, when patient,

standing, strongly exerts herself in "forcing" the uterus, that organ descends to the level of the labiæ. September 22, 1890, operation by laparotomy and suture as in cases 1, 2 and 3 detailed. Two silver wire womb sutures and two catgut sutures over each ligamentum rotunda; no mutilation of parts; incision closed and wound dressed as before. Sutures removed in the usual time. Examination of the synoptic chart preserved in this case shows in most remarkable manner how slight the disturbance following this operation may be in well conducted cases. The highest temperature noted during the times for which the record is kept occurred on the evening of the first day, and was $99\frac{4}{5}^{\circ}$ F.; the highest pulse-rate 100, same date and same hour. Opium was withheld. Nor was there sufficient pain, as a result of the operation, at any time, to make excuse for its use possible. The intestine was regularly and freely evacuated by the use of calomel and drastic enemata. The patient was permitted to relieve herself of urine over the pan. The cases were all treated at their homes, but nursed by intelligent and trained nurses. The strictest aseptic precautions were in all respects observed.

The first, second, and last cases offer us good examples of their kind where this important surgical interference is demanded, and the test of efficiency of method has been, for each one of these operations, severely tried; and we may now claim reasonably that sufficient time has elapsed to enable us to claim cures. The remaining case was probably not so carefully selected for operation, and not so well understood, partaking in its character of neuroses derived through gastric derangement and digestive disorder.

THE AFTER-TREATMENT OF CASES OF ABDOMINAL SECTION.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 1891.

BY CHARLES P. NOBLE, M.D.,

SURGEON IN CHARGE OF KENSINGTON HOSPITAL FOR WOMEN, PHILADELPHIA.

According to Oliver Wendell Holmes, to successfully treat an individual one should begin with the grandfather. The same principle applies to the successful after-treatment of cases of abdominal section. Whenever possible, careful preparatory treatment should be carried out. Nutrition should be improved, when depraved; the enunctories should be made active, especially the bowels and skin. Operation should be rapid, careful and thorough. Diseased, and especially suppurating, structures should receive most careful attention, and unless vital organs be completely removed. Asepsis in clean operations, and irrigation and drainage in dirty operations,

are essentials. Under such conditions, unless operation has been made a last resort, or the vital organs of the individual are seriously crippled, proper after-treatment of cases of abdominal section will insure a successful result quite uniformly.

That which is accomplished by after-treatment in cases of abdominal section is principally of a negative character. The object is to protect the patient from all sources of danger, while nature does her perfect work. The most positive ends accomplished are: to sustain the powers of life to enable the patient to pass a crisis; to keep the enunctories active; and to prevent wound secretions from becoming a source of poison.

The after-treatment of typical cases of abdominal section is extremely simple. By typical cases I mean those in which the operation has been done satisfactorily, without special loss of blood, and in which the patient goes to bed without marked shock.

The room in which the patient is to remain should be airy, well lighted, and ventilated. The bed, preferably should be single, and of such a height that the woven wire mattress is two feet above the floor. A hair mattress is the best. The bed should be made warm during the operation by having hot water cans or bottles placed in it. These should remain about the patient until reaction is complete—care being taken to avoid burning the patient.

Diet.—During the first twenty-four hours nothing should be given. Rinsing the mouth with water will relieve thirst partly. If thirst is excessive, enemata of beef tea, eight ounces or a pint, may be given every four hours. This should relieve systemic thirst; but it will not relieve thirst due to a dry mouth or throat. On the second day one or two drachms of water every half hour may be given, to be increased or withheld according to the tolerance of the stomach. After thirty-six or forty-eight hours beef tea, one or two drachms, or an equal amount of milk and lime water or soda water may be given; and increased if well borne, the frequency of administration being decreased. If all goes well, on the fourth or fifth day water, practically *ad libitum*, may be given. After a week soft diet may be given, and after two weeks full diet.

Drainage Tube, and the Abdominal Wound.—In my judgment the drainage tube should be used unless there is some special contra-indication. If the drainage is not excessive, nor bleeding going on, it is best to surround the tube with sterilized cotton; with the bandage over all. In this way the tube is protected against infection between dressings. A rope of bi-chloride wet gauze should be passed down the tube to Douglas' pouch, and extend externally into the absorbent cotton. Used in this way most of the fluid poured out into the pelvis will escape by

capillary action, and draining the tube will be unnecessary more than twice or three times in twenty-four hours. In this way the tube can be managed by the surgeon. All soiled cotton should be removed at each dressing, and the outside of the tube be kept aseptic by washing with sublimate solution. It is well also to keep the gauze over the wound wet with bi-chloride solution, until the tube is removed. In draining the tube, the rope of gauze is removed, a pledget of aseptic cotton is seized with an aseptic forceps and passed down the tube. This is repeated until all fluid is removed. When the pelvis has been made dry, it is well to pass one pledget saturated with sublimate solution. The wet sublimate gauze drain is next inserted, and the cotton and bandage readjusted. This method of managing the tube has given perfect satisfaction in typical cases.

When drainage is excessive or hæmorrhage is going on, it is better to use the rubber dam about the tube, having it project through the bandage; this way it is more accessible for draining. The chances of infection are also greater. In this class of cases the tube must be drained often—even every fifteen or thirty minutes in case of bleeding. The piston syringe may be used to remove fluid; but I have found it unsatisfactory. It will not remove all fluid from Douglass' pouch.

The tube should be removed when the drainage ceases to saturate the gauze rope in the tube, especially if the drainage has become serous. In most cases the tube will remain in from one to three days. When the tube is removed early, the wound should be closed by tying a provisional stitch introduced during the operation. If for any reason it has been necessary to use the tube five or six days or more, it should be elevated from day to day, perhaps a shorter one substituted, and finally a plug of gauze, inserted through the abdominal wound, be used. In this way a sinus can at times be prevented. In such cases the judicious use of sublimate solution, and the peroxide of hydrogen solution within the tube track is of great value. These agents should be used on cotton carried down the tube in the grasp of a forceps.

The hands of the surgeon must be made aseptic before each dressing of the tube, and the tube forceps must be kept aseptic. By having the forceps well nickle-plated it can be washed before use in sublimate solution. After use it should be carefully washed with soap and water. With a little practice the surgeon can drain the tube with but little use of his fingers. Only the thumb and forefinger of the left hand need come in contact with the cotton or that part of the tube forceps which passes down the tube. The method employed is as follows: small rolls of absorbent cotton are wrapped in tissue paper, and sterilized

in the steam sterilizer. A roll of cotton partly unwrapped is held by the nurse, the tissue paper serving to keep her fingers from touching the cotton. A pledget of cotton is seized by the tube forceps, lightly wrapped about the forceps by the thumb and index finger of the left hand, and then passed down the tube. It may or may not be necessary to steady the tube. The process is repeated until the pelvis is dry. It is manifest that if special care is taken in cleaning one thumb and forefinger that asepsis can be maintained. And this can be done with little expenditure of time.

A satisfactory method of dressing the wound is to use a wet sublimate gauze dressing until the tube is removed, and then to apply a powder consisting of iodoform one part, and boric acid seven parts. The deep sutures should be removed on the seventh or eighth day; at which time the wound should be supported with adhesive straps. Some days later the superficial stitches may be taken out.

The Bladder.—It is best to encourage the patient to void urine. When necessary the catheter must be used. Every care should be taken to avoid catheter cystitis. This is best accomplished by using a glass catheter, having it carefully washed in running water after use, and kept in sublimate solution until needed again. Before the catheter is used the vestibule should be wiped dry with absorbent cotton. Then the catheter, properly lubricated with vaseline, should be introduced, the parts being exposed.

The Bowels.—The bowels should be moved early—the second or third day. I believe that the pain after abdominal section is largely intestinal—due to flatus, or to irregular peristalsis—and that the best way to relieve it, is to open the bowels. The plan of giving a brisk cathartic shortly before operation so as to secure an early evacuation of the bowels, commends itself to my judgment, though I have not employed it. On the second or third day an enema is given; and should this fail, calomel in twelfth-grain doses, every half hour, or concentrated citrate of magnesia solution. (Four ounces equals one pint of official). Epsom and rochelle salts have proved too nauseating for my patients.

As an enema the following is used: Magnesia sulphet., two ounces. Ol. terebinth, one-half ounce. Glycerini, two ounces. Aquæ, q. s. ad., four ounces. This mixture is a very reliable purgative enema.

The bowels should be kept open at least on alternate days throughout the convalescence. Special care should be taken to prevent the accumulation of scybalous masses.

General Care, especially by the Nurse.—During the first few days, or period of thirst and pain, the patient should be encouraged to bear up, and be told that pain is quite the rule after abdomi-

nal section. Nervous, fretful patients must be impressed with the fact that nothing will be given that is not thought good for them, and that personal teasing appeals will avail nothing. As a rule, a good *morale* can be thus established. The nurse can do much to promote the comfort of the patient. During the period of thirst the face and hands should be bathed frequently with ice water or cold water and alcohol. And the mouth should be rinsed frequently with ice water or a weak solution of permanganate of potassium, or of peroxide of hydrogen. Glycerine and ice water will at times relieve "dry mouth" but generally the sweet taste of the glycerine is objectionable. The nurse should be given the rectal tube, and should use it whenever pain from flatus is present.

The bed ought to be kept strictly clean, and the sheets be kept smooth. The draw sheets and the bandages should be changed at least twice daily. The patient's back should be rubbed well with alcohol or soap liniment two or three times daily. She should be allowed to flex the legs and thighs, when the legs can be comfortably supported by placing a small pillow under the knees. Cotton wool pads or an air cushion should be provided to ease the back. Attention to these details adds much to a patient's comfort.

I believe that it is best to keep patients on their backs for two weeks after abdominal section. During the first week comfort is best attained by avoiding all motion. After eight or ten days the use of the bed rest permits sufficient change in position. After three weeks the patient may be permitted to sit up in bed. Hernias are best avoided by careful suturing, and by rest until firm union has occurred.

COMPLICATED CASES.

Shock.—Shock is met best by the application of external heat, the use of strychnia, digitalis, caffeine, and whisky hypodermically, and of decoction of coffee or beef tea by rectal enema. Within eight hours, thirty minims of the tr. of digitalis, one-eighth of a grain of sulphate of strychnia, and two or three grains of the citrate of caffeine may be given. If recovery is not prompt, one-half of a grain of the sulphate of strychnia, and one drachm of tr. of digitalis may be given in twenty-four hours, and an enema of beef tea, eight ounces to one pint, with whisky, one or two ounces, may be given every two or four hours. This treatment can be continued for some days. If much blood has been lost, large amounts of fluid will be absorbed from the rectum. A saline solution, also, may be injected into the areolar tissue under the skin. After one or two days, if rectal feeding is necessary, a more nutritious mixture should be substituted. I have used the following:

One egg; milk eight ounces; peptonize and add whisky one or two ounces. This quantity can be given by enema every six hours. If rectal feeding is kept up for many days, it is well to wash out the rectum daily with soap suds, so as to remove decomposing material, and prevent proctitis.

Vomiting.—Vomiting from ether cures itself. When vomiting continues more than two days, some other cause must be sought. If not excessive, vomiting will usually cease if no fluids are given by the mouth. A mustard plaster over the epigastrium, or a tumbler full of hot water will at times arrest it. If simple means fail, it will be found that the vomiting is due to peritonitis, or to impending obstruction of the bowels. In either case the bowels should be moved at all hazards. This is accomplished best by the use of the purgative enema already noted, given if necessary through the rectal tube into the colon. Broken doses of calomel can be given when other purgatives are rejected. Concentrated solution of citrate of magnesia, and seidlitz powders also can be used. The continued use of these agents usually will open the bowels. Secondary abdominal section for the relief of obstruction should not be undertaken too quickly, as not infrequently the bowels are moved only after repeated efforts; and moreover, the results of the secondary operation are not encouraging.

Fever.—When fever occurs the bowels should be kept freely open, and the body be sponged freely with cool water. The use of antipyretics is of doubtful value. When to re-open the abdomen for peritonitis, and when to trust to medical measures is a difficult problem. In general, when the skin is dry, the face flushed, and the pulse full and bounding, secondary operation will be unnecessary; but when the skin is "leaky," the extremities cool, and the pulse rapid and feeble, absorption of septic material is going on and operation is indicated. Unfortunately, the result usually is death.

Opium.—The use of opium in any form in typical cases of abdominal section is unnecessary. A little encouragement during the first day or two will enable the patient to stand the pain, and later it is quite bearable. Occasionally morphia is useful when a nervous patient becomes much excited and cannot otherwise be controlled. I feel convinced that the experience of the past few years has demonstrated the fallacy of the doctrine that opium is curative in peritonitis; and that it finds its legitimate field in abdominal surgery in combating extreme nervous excitation, and in easing the last hours of the dying. Occasionally it may be used temporarily to relieve extreme pain.

Asthenia.—Asthenia must be combatted by the systematic use of nutritive enemata with whisky, together with the administration of such liquid

food as the stomach will bear. Champagne can often be given with advantage when other stimulants are rejected. Less can be done to combat asthenia by alimentation and medication after abdominal section than after other operations, because as a rule the stomach is not available. The fate of the patient is decided, in general, when the operation is completed.

"PYOKTANIN" AS AN ANTISEPTIC.

Read by Title in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY H. J. BOLDT, M.D.,

OF NEW YORK.

PROFESSOR OF GYNECOLOGY, POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; GYNECOLOGIST TO ST. MARK'S HOSPITAL AND THE GERMAN POLYKLINIK.

Among the remedies introduced as antiseptics lately, is one called pyoktanin, of which Prof. Dr. J. Stilling, of Strasburg, is the discoverer. The advantages claimed for this analine compound are that, 1, it is devoid of any injurious effect on the human economy or organism; 2, certainly and utterly destructive of all bacteria or other microorganisms absorbing it; and 3, that it is rapidly diffusible in, and permeant of, both healthy and diseased animal tissues or fluids, and perfectly penetrant through the enveloping membranes and internal substance of all bacterial colonies harbored by them.

The respective remedy, which is manufactured by E. Merck & Co., has been given a thorough trial by me in suitable cases for but a comparatively short time, but even with so short a trial, it has impressed me very favorably. The suppuration ceases more rapidly under its influence than under the use of other remedies, and that without producing any noticeable unpleasant effect on the system.

Stitch hole abscesses, two sinuses with thick pyogenic membranes, and purulent endometritis, were the conditions for which it has been put to use, employing a 1 per cent. *watery* solution, which is five to ten times stronger than recommended. Such strong solutions were used because those as recommended did not seem to me to do any better service, after a few trials, than some of our other antiseptics, which had the advantage of not discoloring everything with which they come in contact, that being the main disagreeable feature in connection with the use of pyoktanin—the discoloration produced being a deep purple, which can only be immediately removed from the hands by washing with soap liniment or javelle water. Clothing, etc., is destroyed by the stains, or the use of the javelle water required for washing them, hence some care must be exercised in its use. This unpleasant feature can, however, not come into consideration, if we remember that the conditions for which I have used

it are of very obstinate character, and withstand our ordinary remedies with a tenacity which sometimes brings us to despair, with pyoktanin applications I have seen them yield almost invariably with ten to twenty daily applications. In the more mild forms, as stitch hole abscesses, three or four days sufficed to bring suppuration to cessation.

In the form of endometritis mentioned, the remedy is injected directly into the uterus with a Braun syringe, and so far, none of the unpleasant effects have been noticed which we are apt to see from iodine, etc. 1, the cervical canal is always patent in such conditions, so that over-distension, if the injection is carefully made, never occurs; and 2, the remedy is non-irritant.

I have briefly stated my own personal experience, thereby hoping to stimulate my colleagues for a further trial. In carcinoma, for which it is also used very extensively, my experience is yet too limited to speak one way or the other.

IRON IN LARGE QUANTITY IN ANÆMIA.—In a very marked case of anæmia in a young girl of 19, H. Taylor, after being assured of the satisfactory condition of the digestive functions, prescribed for her a drink of a diluted solution of the perchloride of iron (v-xxv drops to 30 cc. (3j) of water). He gave her to understand that the more she took day and night, the better it would be for her, and the sooner would she recover. She entered heartily into his plans, and in twenty-seven days took almost 900 grams (3xxx) of tincture of the perchloride of iron (according to the British Pharmacopœia), instead of 100 grams, the maximum dose with most physicians. There were no unpleasant phenomena on the part of the digestive tract. To keep the bowels regular, he gave daily a pill of aloes and nux vomica. The result was complete cure after four weeks of treatment. The author recommends this mode of treatment, which allows the ingestion of large quantities of iron, without in any way interfering with the health of the patient. Should the iron commence to show any unfavorable effects (constipation, etc.), the patient should stop the medication, which no longer agrees with him.—*La Courrier Médicale; La Gazette Médicale de Montréal.*

UNIQUE PROCEDURE IN A CASE OF PHOTOPHOBIA.—A boy of 13 was affected with a panniform keratitis of both sides, with intense photophobia. Each time that the pupils were exposed to bright light, the boy was seized with violent sneezing. A pledget of cotton charged with a few drops of chloroform was introduced into the external auditory meatus and in a few minutes the eye could be opened without the occurrence of sneezing. The author (Gutteriez-Ponce) explains the effects of this local medication by anæsthesia of the Gassenian ganglion which is situated in the neighborhood of the auditing canal. This ganglion might be the center of the reflex action giving rise to the sneezing, consecutive to the impression on the retina by a bright light.—*Journal de Médecine de Paris.*

A BOUNTY of one hundred francs is offered to every married couple in France who shall add one more citizen to the State during 1892. It is hoped in this way to check the decrease in the French population.

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BY-LAW IV.—THE PUBLICATION OF PAPERS AND REPORTS.

No report or other paper shall be entitled to publication in the volume for the year in which it shall be presented to the Association, unless it be placed in the hands of the Board of Trustees on or before the first day of July. It must also be so prepared as to require no material alteration or addition at the hands of its author.

Authors of papers are required to return their proofs within two weeks after their reception; otherwise they will be passed over and omitted from the volume.

Every paper received by this Association and ordered to be published, and all plates or other means of illustration, shall be considered the exclusive property of the Association, and shall be published and sold for the exclusive benefit of the Association.

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SATURDAY, JULY 11, 1891.

ELIMINATION.

It may be accepted as true that microörganisms do their work by means of their chemical products. Whether their products be formed within or without the body, if they once gain admission to the blood stream they have full opportunity to produce their peculiar symptoms. Until suitable means shall have been provided for directly attacking the microörganisms themselves, there remain but two avenues of curative treatment open, viz.: the neutralization, and elimination of their chemical products. Leaving for the present the work of neutralization to the liver, the question of elimination presents itself as the one more easy of solution. Looking back to our fathers in medicine, whom perhaps we are too prone to neglect, we are at once impressed with the attention which they paid to this subject. Attend first to the *primæ viæ*, was their great watchword. Their purgatives and emetics, their calomel and tartar emetic, were used much more intelligently than we use them to-day. Venesection was probably in most instances an eliminative procedure, and although now entirely out of fashion, it is fair to prophesy that it will soon again hold an honored place as a thera-

peutic measure, even if it must gain this place indirectly through the channel of relief to purely mechanical conditions of the circulation, as exemplified in the recent paper of Dr. H. A. Laffleur (*Med. News*, Vol. LIX., p. 5). In addition to the three great eliminative channels, the kidneys, the skin and the bowels, attention should be directed to the lesser or secondary channels.

To what extent respiration is eliminative is not established, although the poisonous properties of the expired air have long been known, yet it is probably true that the nervous symptoms which occur in the pneumonias, are partly, if not entirely, due to the mechanical limitation of this particular eliminative channel. Running sores are no doubt important means of elimination as well as possible sources of infection, and the layman's idea of the danger attendant upon the sudden healing of those old wounds, may not be entirely without foundation.

To what extent may one channel of elimination be substituted for another? Every practitioner knows only too well that the bowels as stimulated by active purgatives, and the skin as excited by the hot bath, and pilocarpin, furnish but a partial substitute for the kidneys. But does it follow that the channels themselves are at fault and that the means of stimulating them is of secondary importance? Should the channels alone be considered, or should they be thought of in connection with the means by which they are opened? The sweating produced by pilocarpin differs apparently in no way from the sweating which follows the use of antipyrin, acetanilid, or any other of our modern, so-called, antipyretics. Yet the results following the two remedies are essentially different. Ignoring the other actions of the antipyretic it is quite possible, nay probable, that the antipyretic sweat carries away other substances than does the pilocarpin sweat.

The blister as a means of securing elimination through the skin is in frequent use, but not so frequent as its importance warrants, while cups are relegated to the barber. Leeches are occasionally employed, but venesection dares not even lift its head.

To inflict a wound, for a medical rather than a surgical reason, would probably be considered cruel, and to even mention a seton in these days of asepsis, might lead to professional ostracism.

Nevertheless if elimination is to do its best for humanity, it must be studied broadly, and all phases of it utilized.

The interchangability of the several eliminative channels must be more carefully studied, the best channel, or channels, to appeal to in given conditions, and the best means of opening these channels under the particular circumstances, must be worked out at the bedside, and finally those neglected means of elimination, whose assistance at a critical moment may save life, must be resurrected, and the despised blister, lancet, and seton again called back to active use, and again given their proper sphere.

SCIENCE COURSES PREPARATORY TO MEDICINE.

In a recent number of *THE JOURNAL*, was published a circular sent out by the Illinois State Board of Health to about 200 literary and medical schools in the United States. We learn from the Board that about twenty-five literary institutions have already adopted, or signified their willingness to adopt, science courses leading to the study of medicine. It is gratifying to note, that in addition to some large universities, some of the smaller colleges have recognized the fact that a young man must have a special training in science to be prepared for the study of medicine.

It has been objected to courses preparatory to the study of medicine, and even to higher medical education, that the people have not yet demanded scientific physicians. This is not entirely true. The representative newspapers of the country are demanding better educated physicians, and in any event, the medical profession must take the lead in this matter. The longer and better courses of study in the medical colleges are due to prolonged agitation, begun by the medical profession. The same will be true of whatever is done in the way of establishing science courses preparatory to medicine. That such courses are profitable no one can doubt. The President of Tulane University of Louisiana writes: "The College and University give every one the opportunity to go to the medical college prepared. When they do so, they always succeed in taking the prizes of the medical department, the posts of resident students in the

Charity Hospital, twenty-eight in number. All who have tried have, on competitive examination, taken a resident's place."

The statement made by President Johnson is confirmatory of the opinion of thinking men, that after an ordinary high school or classical course the young man is not prepared to begin the study of medicine, while a proper science course gives the needed preparation; and that the student who takes such a course gains a liberal education—as liberal as that offered by any classical course. As was aptly pointed out by Dr. Gardiner in his presidential address before the British Medical Association a few years ago, the physician must be a naturalist, a student of nature, and the foundation of his knowledge must be laid in scientific studies. There is no good argument against science courses, preparatory to the study of medicine, and it is gratifying to know that some of the literary institutions are taking up the matter so earnestly. They would not have done so had they not recognized a demand for such courses and a demand for better educated physicians. The drift of human thought is more and more toward pure science and its application to human progress.

HIGHER MEDICAL EDUCATION.

The cause keeps marching on. At the late meeting of the Indiana State Medical Society, the following preamble and resolution were adopted:

WHEREAS, Responding to the demand for advanced and thorough medical education, the schools of regular medicine in Indiana have made compulsory on all students matriculating for the first time after this date, as a pre-requisite to graduation, four years' study of medicine, and three full courses of lectures of six months each, therefore,

Resolved, That this Society heartily endorses such action, and, as a matter of simple justice to those schools who have taken this advanced position, we respectfully request the authorities of this State to consider and class medical schools, who demand less than the above requirements, as institutions not reputable, and their diplomas unworthy of recognition.

N. D. COX, M.D.

WM. FREEMAN, M.D.

Unanimously adopted.

We are pleased to also announce that the Indiana State Board of Health are in full sympathy with the above, and will take similar action as one of the standards of requirement.

DR. JOHN H. RAUCH.

At the last meeting of the Illinois State Board of Health, this veteran official tendered his resignation as Secretary of the Board. For more than a quarter of a century DR. RAUCH has given a whole-hearted and enthusiastic service to the cause of sanitary science, and to an elevation of the standard of medical education and practice. In these departments his labors have been characterized by such ability and good judgment as to win the plaudits of right thinking men on two continents. That he has been untiring and indefatigable in the prosecution of his plans, there can be no question; their accomplishment is known to the world.

In noting the recent action of the Kentucky State Board of Health, and of the Indiana State Medical Society, we could not but feel that the sentiment back of their resolutions, was largely due to the work that is now laid down by this honored servant of his profession and the public. At the same time we thought of the sense of profound satisfaction that must fill his soul as he contemplates the grand results which have been achieved, and to so great an extent through the instrumentality of his own work.

EDITORIAL NOTES AND ITEMS.

NEW EFFERVESCENT PREPARATIONS.—Among the granular effervescent preparations, recently brought out in England, are the following: Citrate of caffeine, three grains to the drachm; salicylate of soda, ten grains to the drachm; sulphur compound according to Garrod's formula; and cascara sagrada, two grains in each drachm. The *Lancet* reports that an analytical examination has been made, which shows that the weights and proportions were correct as claimed by the makers. The preparations were found to be readily soluble, and the granulation of them had been accomplished with all necessary care. These appear to be especially acceptable to children, who will often take a preparation that "fizzes"—as they say—although the drug contained in it may be anything but pleasant to the taste.

THE BOARD OF HEALTH OF NEW YORK CITY.—Col. Emmons Clark, the experienced secretary of the Board of Health of New York City, has contributed to the *Popular Science Monthly Magazine* a history of the workings of that Board

during the quarter-century during which the author has been officially connected with sanitary administration. Although a trifle bureaucratic and colorless in its composition, Col. Clark's sketch is a model of condensation, and will interest report-making sanitarians all the world over. A few lines comprise, oftentimes, the work of years and the best efforts of a regiment of toilers. The great city of which he writes was virtually devoid of any sanitary administration until 1866, when the popular dread of an epidemic of cholera compelled the enactment of an efficient sanitary police law. Since that time the Board has been remodeled from time to time in the interests of "hungry politicians," but there have always been some good and honest workers in its service. Progress, amid many interruptions and in spite of many discouragements, has been the rule. Some of the earlier printed annual reports of the Board are extremely valuable. The accomplishment of the Board in regard to the check and regulation of infectious diseases, appears to have been the strongest single feature of its work. One of the peculiarities in the New York Board is the fact, the law forbids that a medical man shall be its president. A chemist or a cotton broker may become the sanitary standard-bearer of the metropolis, but a physician never. But the law may be changed before many years have passed by, possibly at the next session of the State Legislature. The present enactment is an anachronism from the medical standpoint, and will undoubtedly soon be rescinded.

HONORS.—The degree of LL.D. has been conferred by Wabash College upon Dr. Joseph Eastman, of Indianapolis. The same degree has also been conferred by the University of South Carolina upon Dr. F. Peyre Porcher, of Charleston.

"IT HAS recently been ascertained that the vapor of vitriolic ether, when inhaled into the lungs, produces effects upon the brain and nervous system similar to those of nitrous oxide gas. This fact was no sooner made public than a thousand experimenters started up, including all ages and both sexes. The smell of ether prevailed everywhere. Even the little school-boys were seen clubbing their pennies to purchase a vial of the exhilarating fluid, which was put into a paper bladder and eagerly passed from one to another, in some unfrequented spot. We

might, perhaps, feel amused at the ridiculous capers supposed to be cut by those groups, had no serious consequences resulted from it. But having ourselves witnessed the serious indisposition of several young ladies, which could be ascribed to breathing ether, and read of two well attested cases in which the practice proved fatal, it behooves us to condemn the use of the fluid by inhalation as highly pernicious and dangerous."—(Portfolio by Oliver Oldschool, Esq., July, 1824, p. 326.)

AN OPHTHALMIC HOSPITAL IN CINCINNATI.—Dr. Robert Sattler has given a valuable property for the establishment of this institution. A staff and dispensary service have been organized, and arrangements made for giving special instruction to students.

DOMESTIC CORRESPONDENCE.

Diphtheria.

To the Editor.—Some twelve or fifteen years ago I wrote an article on diphtheria which was published in a local paper, claiming it to be an affection of the pneumo-gastric nerve. And now, after long and careful observation, I am impelled not only to confirm that earlier statement, but to add to it the result of maturer consideration by bringing to your notice a more detailed account of my idea of this troublesome disease.

I believe the entire eighth pair of nerves to be affected. I believe the diphtheria microbe or bacterium to have an especial affinity for this pair of nerves, causing an inflammation of them, affecting particularly the glosso-pharyngeal and pneumo-gastric; but involving also, occasionally, the spinal accessory.

If any medical gentleman will spend two hours in refreshing his memory on the exact distribution of the two first named, and then sit by the side of a patient suffering from diphtheria and carefully compare the location of the affected parts with the distribution of these nerves, I think he will come to the same conclusion.

As to the false membrane, I have always regarded it as a passive exudation caused by the loss of nerve force of the capillaries of the parts from which it exudes. One of the first and most positive diagnostic symptoms of diphtheria is the enlarged tonsil covered with false membrane. Gray says as to the anatomy of the tonsil: "Its inner surface presents from twelve to fifteen orifices, leading into small recesses, from which numerous follicles branch into the substance of the gland. These follicles are lined by a continuation of the mucous membrane of the pharynx covered with epithelium, their walls being formed by a layer of closed capsules imbedded in the sub-mucous tissue. The capsules are analogous to those of Peyer's glands. They contain a thick, greyish secre-

tion. The nerves are derived from the fifth and the glosso-pharyngeal."

Now, is it not reasonable to believe that the loss of contractile force of the small nerves of the tonsil from the inflammation of the parent nerve, together with the devastations of the microbe in the tonsil, largely increase the "greyish secretion," and that this exuding through the "twelve or fifteen orifices," has something to do with the formation of the false membrane? That looks reasonable to me and I believe it to be the true source of this false membrane, as well as of all that found in this nerve tract. I believe these exudations to be similar to the petechial exudations over the chest and abdominal regions in cerebro-spinal meningitis, typhus and low grades of typhoid fever. When the spinal cord is implicated exudation takes place from want of nerve contractile force of the peripheral aspect of the spinal nerves and forms in scales, nodules, etc., of various sizes and appearances.

Treatment.—The problem of treatment may be readily formulated. If the streptococcus of diphtheria selects the eighth pair of nerves and branches for its terrible ravages, have we a germicide with an equal affinity for the same region? I am ready with an emphatic Yes! We undoubtedly have such a germicide in the different preparations of mercury, especially calomel. The uniform success of the treatment which I have adopted is the rock on which I found this statement.

Calomel was used with success as far back as 1825, although physicians of that date had no idea of the reason for this success with that specific, nor has, hitherto, any explanation been attempted. I quote from the London Medical Repository of December, 1826, page 499:

"Mercury, which seems to exert a direct and almost specific influence upon inflammation of the mucous membrane of the throat and air passages, has been highly extolled by the French physicians in the treatment of diphtheria. It was first employed by Dr. W. Connolly, of Chettenham, then resident physician at Tours, and with such success, invariable, that the French practitioners, although with some reluctance, adopted it in their practice. To secure it success the full mercurial influence is necessary; with this object, two grains of calomel are to be given every two hours."

In my own practice I have adopted the following:

I give from one to five grains of calomel every five hours, according to the age of the patient, with no other treatment except cleanliness and good nursing.

The medicine is easy of administration by putting it on the tongue and giving a sip of water.

I think two or three brisk operations on the bowels, a day, beneficial for the first two or three days, but should the cathartic effect be too great it is easily checked by a little Dover powder. It is surprising what an amelioration of all symptoms takes place after three to five days of this treatment. The false membrane dissolves and disappears, the microbes become inert from the specific action of the mercurial poison, the temperature becomes normal, the pain and swelling are gone, the appetite returns, and above all, that unaccountable nausea and vomiting, which follow a week or ten days in the wake of

diphtheria, never put in an appearance. More than all, I have yet to see a case of paralysis of even the soft palate follow diphtheria when this treatment has been adhered to from the beginning. When called to see a diphtheria patient, in addition to above treatment I give to other children of the family that have been exposed to contagion, from one to four (according to age) one-tenth grain calomel pills every five hours for two or three days as a preventive, with uniform success, a large majority thus treated escaping the disease or suffering only a light touch of it, the germicide entirely protecting those parts usually affected by diphtheria.

Do not be afraid of the calomel. The verge of ptialism must be reached in order to secure the best results.

We do not fear salivation now as we did when I first began the practice of medicine, over fifty years ago. At that time we could not control it; now, with chlorate of potash, we regulate it with absolute certainty.

If medical gentlemen who have the opportunity of making post-mortems upon patients having died of diphtheria will thoroughly investigate the changes that have taken place in the eighth pair of nerves, and, if it presents the appearances which I believe it will, my theory will be perfectly established, at least in my own mind, and I shall feel greatly indebted to them if they will report the same to me or to THE JOURNAL of the Association.

DR. W. R. MCMAHON.

No. 312 South Front street, Mankato, Minn.

Forced Respiration. Letter from Dr. Fell.

To the Editor:—Your correspondent, Dr. Herzog, of Hoboken, N. J., leads me to believe from the tenor of his article on "Forced Respiration," in the May 9th number of THE JOURNAL, that he has not read my address upon this subject with that care which it deserved. Had he done so, I am inclined to believe that so much of the valuable space of THE JOURNAL would not have been given to the elaborate account of an instrument which undoubtedly was never used to save human life; or, if it had been, it would likely have failed ingloriously. I will not now be surprised if some one should add that Hippocrates had thought of forced respiration, and even devised an apparatus to perform it with. John Hunter did both, and possibly others, but we have no record of any of these noted men having applied their invention to the saving of human life. See Prof. Horatio C. Wood's remarks in his address before the Berlin Congress, in which he says: "but I have not found that either Hunter or Richardson treated by forced artificial respiration, an actual case of disease or poisoning."

In all this apparatus a grave defect existed, in my opinion, in that provision was made to exhaust the air from the lungs; this complicates the apparatus, and, furthermore, is not in accord with physiological conditions, as inspiration is a forcible measure, while expiration, being passive and produced by the elasticity of the fibro-elastic tissue of the lungs, does not call for the utilization of mechanical means to produce it. I also believe that an apparatus provided with means for ex-

hausting air from the lungs, would prove a very dangerous instrument to place in the hands of the average physician in an emergency case.

However, no one will question that Richardson, Hunter, the designer of the apparatus mentioned in Dr. Herzog's letter, and several others whom I could cite, have prepared or invented instruments for forced respiration upon human beings.

With all their labor, what did they accomplish? Was a single human life saved by them? Did they demonstrate the wonderful possibilities of the method? Let us see. After my first operation with the instrument used in my physiological laboratory, and with which, notwithstanding its defects or adaptation for the purpose, I had succeeded in keeping my patient alive for nearly three hours, until he breathed for himself, I looked up the home and foreign literature on the subject. Nothing was discovered which appeared to controvert the fact, that I was justly entitled to the credit of being the first to systematically and practically solve the question of the value of forced respiration in the saving of human life; or that I had demonstrated, as one physician puts it, "that air can be forced into the lungs without any damage to them." Whatever has been accomplished, also should be stated, was without any previous knowledge of the failures in the same field, which had antedated my efforts.

I can say, with the practical knowledge obtained from operating upon human beings, that the instruments used in the physiological laboratory do not meet the conditions to be successfully overcome in breathing for a human being for any length of time. They may answer in some instances as a make shift, but the work is carried on at a great disadvantage, and with many chances in favor of producing, instead of averting, a fatal result. They were never intended to be used upon human beings. The instrument originally devised by myself in all its practical details, and with which the results tersely detailed at the end of this letter were accomplished, was founded upon the experience obtained in my first case, and the results of my labor with it so overwhelmingly annihilates any controversy in opposition to its use, that it is needless to do more than present them to the profession. Had similar results or demonstrations been accomplished at the hands of others in the past, nothing could have prevented them from receiving the widest publicity in the medical literature of the day, but no record is found which detracts from the practical value and originality of my labors. As a physiologist, I was acquainted with the apparatus used in the physiological laboratory, from the simple bellows with nozzle poked into the trachea of a dog, to the more complicated constant Sprengle blower with interruptor, which admittedly would be of no use as an emergency instrument.

The apparatus I have used meets all requirements for forced respiration in man, with or without tracheotomy, and in the *simplest manner*. It covers all the methods which can be utilized in the operation, is adapted to be used out of doors or in a cold atmosphere, but may be modified by an arrangement to provide a constant air supply and automatic inspirator, which would, however,

increase the cost, and do away with the emergency feature of the apparatus, as now used.

Dr. Herzog's article, possibly without intent, would naturally lead to the inference that the subject is old, not worth considering; its tenor is not uncertain. The truth is that the work in forced respiration, prior to my own, and running through the past century to a great extent, had simply relegated it to the list of unjustifiable procedures. Do we find anything previous based upon *results* recommending us to use forced respiration after all other methods of artificial respiration had failed? On the contrary, we do find in every medical work treating on the subject, the "Ready Method in Asphyxia of Marshall Hall," the highest accepted authority, that we *must avoid the use of bellows* or any forcing instrument.

Now I propose to talk plain, as it seems entirely unnecessary at this late date to mince words upon this subject. The practical introduction to the world of the value of forced respiration in the saving of human life, the demonstrations which indicated its great possibilities, must be accredited to an American, and the work of others in the past had nothing to do with the results which were original in conception and practical application.

The question simply amounts to the difference between failure and success; will the credit be accorded to those who failed or the one who succeeded? If Columbus had prepared his ships, but not sailed across the Atlantic, would he have discovered America?

What also must be admitted by those who are inclined to accord justice to whom it is due, is that the practice of vivisection in the colleges and laboratories of the land, had no relation whatever to the saving of human life, or had it been ever taught in medical institutions, systematically or otherwise, as of any value in saving human life. For over eight years prior to my first operation of forced respiration upon a human being I had been a practical vivisectionist in the physiological laboratory, and during that time I never heard it even hinted that a human life might be saved by the laboratory methods.

It was in the field of paralysis of the respiratory centres from opium that I began my work with forced respiration and the demonstrations as to its efficacy, from the first, could not be questioned. Each and every case saved had passed beyond the limit of hope so far as all known and systematically applied methods of resuscitation were concerned. To be denied the credit which should in all fairness be accorded to the practical originator of a method of such far reaching importance in the saving of human life is what I could not quietly submit to. "Honor to whom honor is due."

RÉSUMÉ OF CASES OF FORCED RESPIRATION TO DATE.

Case 1.—Buffalo, N. Y., adult, morph. sulph., 20 grains taken. Artificial respiration and antidotes had failed. Case given up as hopeless. Dilatation of pupils, last stage of asphyxia taken place. Forced respiration for two and one-half hours, with difficulty on account of incomplete apparatus, saved patient.

Case 2.—Prof. Dr. Boehm, Vienna, Austria. Two months later, and after Case 1 had been fully reported

to the Medical Congress at Washington, and published by the public press. Adult. Nearly 8 grains morph. sulph. taken. Artificial respiration failed and forced respiration saved the life of the patient.

In these two cases the methods used in the physiological laboratory were applied.

Case 3.—(Dr. Fell's 2nd Case), adult. Tr. opii. \bar{z} ii taken, all absorbed. Artificial respiration, antidotes, pushed to utmost, but they failed. With my new apparatus adapted to forced respiration on man, this patient was kept alive for fourteen hours before he could breathe for himself, and made a good recovery.

With the laboratory apparatus as used in my first case I could not have saved the patient.

Case 4.—Dr. Fell, Buffalo, N. Y. Adult. Tr. opii. \bar{z} ii, taken. Anterior jugular vein and trachea severed by a razor. Hæmorrhage very profuse, patient almost exsanguinated. A corps of hospital physicians had given up the case. The coroner and undertaker even on hand with a coffin. At 5 o'clock P.M., I began breathing for the patient by forced respiration. 9 P.M., patient first conscious; 4 A.M., case considered hopeless; intravenous injection of salt solution \bar{z} vi; 10 A.M., patient improved. At 1:30 P.M., or twenty-one and one-half hours from the time forced respiration was first instituted, the patient was left for a short time to breathe for himself. Becoming tired he requested the renewal of the forced respiration so that fully one whole day was used in forced respiration before auto respiration was thoroughly reestablished. This gentleman is now living in good health at Wheeling, W. Va.

A few months after this my third case, these three gentlemen whose lives had been saved by my labors voluntarily appeared at my request before a section of the New York State Medical Association at Buffalo.

Case 5.—Dr. Fell, Buffalo, N. Y. Adult, 80 years of age. Tr. opii. \bar{z} i taken. Forced respiration kept patient alive twelve and one-half hours after he had been given up by a hospital staff.

Case 6.—Dr. Fell, Buffalo, N. Y. Infant only 18 days old. Morph. sulph. 1 gr. given by mistake of a homœopathic physician.

Five hours after this large amount, equivalent to about eighty doses, forced respiration per tracheotomy kept the child alive nearly five hours. The results in this case were startling in the manifestations produced.

Case 7.—Dr. Fell, Buffalo, N. Y. Morphia in large but unknown quantity taken. Operation of tracheotomy undertaken after the pulse at both wrists lost; dilatation of asphyxia had taken place; auscultation failed to detect heart action; blood venous on tracheotomy. Forced respiration produced the return of the pulse at both wrists, and clear action of the heart on auscultation; blood became arterial; heart ceased beating in about one hour.

Case 8.—Dr. Fell, Buffalo, N. Y. Still born infant. Compression of brain prevented forced respiration from proving successful.

Operation suspended before heart ceased beating.

Case 9.—Dr. Fell, Buffalo, N. Y. Adult. Tr. opii, 2 ounces taken. Face mask held life until tracheotomy

made. Eleven hours of forced respiration saved patient.

Case 10.—Dr. Fell, Buffalo, N. Y. Adult. Morphia, 5 grains to 10, and tr. opii, 2 ounces taken. Forced respiration for fourteen hours saved patient.

Case 11.—Dr. Fell, Buffalo, N. Y. Young woman had taken 1 or 2 ounces tr. opii. Forced respiration for four hours with face mask saved patient.

Cases 12, 13, 14.—Dr. C. R. Vanderburgh, Columbus, Ohio. Three cases, face mask used. Forced respiration for two to four hours saved patients.

Case 15.—Dr. Fell, Buffalo, N. Y. Adult female. Morph. sulph. in large quantities taken. Forced respiration for seven hours kept patient alive, where Sylvester's method of artificial respiration in the hands of another physician signally failed to prevent returning cyanosis. Forced respiration with face mask quickly overcome it, but was given up for Faradayism which resulted fatally. Forced respiration would have saved this case.

Case 16.—Hospital case reported as saved by the Fell method. Particulars not obtained.

Case 17.—Dr. Fell, Buffalo, N. Y. Young lady medical student took 15 grains of morphia. Forced respiration with face mask for three hours, and per tracheotomy for about ten saved her life.

During this case auscultation failed to detect heart action and pulse at wrist was absent for a time.

Case 18.—Dr. Fell, Buffalo, N. Y. Adult. Over doses of phenacetin, morphine and cocaine taken accidentally. Forced respiration for eleven hours with the face mask, and per tracheotomy for about seven, failed to save life. Dr. Fell was absent some time before death took place.

Oxygen gas was used in connection with the apparatus with good results in these last two cases.

Case 19.—The value of forced respiration as a tiding-over measure in various conditions was exemplified in the following case. An old lady, seventy-three years of age, had taken, through the careless of a druggist, a dose of aqueous solution of corrosive sublimate. It resulted in producing a condition of shock; cyanosis was supervening, and death, which was inevitable, would have soon ensued. Forced respiration with the face mask easily applied, toned up the system so that respiration was much improved, and the patient lived about two days longer for the treatment.

Oxygen gas in this case, probably at too late a period, had no influence on the case.

I have received indefinite reports of cases occurring at other points which I am unable to report at this time. The record is sufficiently full to indicate the wonderful results of the method.

As the necessity has arisen by which the successful methods in forced respiration may be distinguished from those which are obsolete or impracticable and have resulted in casting a ban upon a most valuable operation by which, when properly applied, many human lives may be saved, I suggest that my method be known as the *Fell method of forced respiration*. Briefly it covers the method per tracheotomy, face mask or intubation tube, with the regularly intervalled respiratory movements indicated by the bellows, and controlled by the air valve in the hands of the surgeon; or the use of the bellows and other factors without the intervention of the air valve.

Very respectfully, GEO. E. FELL, M.D.
72 Niagara St., Buffalo, N. Y.

BOOK REVIEWS.

MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.
DISCUSSION ON ANÆSTHETICS. Edited by J. WALKER DOWNIE, M.B., F.F.P. and S.G., Secretary. Glasgow; 1891. pp. 136.

This little book is a reprint from the *Glasgow Medical Journal* of a discussion on the subject of Anæsthetics which took place at three successive meetings of the Medico-Chirurgical Society of Glasgow, held respectively October 17, 24 and 31, 1890. There is an introduction by Dr. William Macewen, and papers as follows: "The Action of Anæsthetics on the Respiration and Cardiac Action, and on the Risks Incident to this Action," by Dr. Joseph Coats; "On the Relative Value of the Various Anæsthetics," by Dr. T. Brown Henderson; "Ether as an Anæsthetic," by Dr. Hartley, of Leeds; "On Primary Chloroform Syncope," by Dr. Robert Kirk; "Thirty-five Years Experience of Anæsthetics," by Sir George MacLeod; "Anæsthetics in Relation to Midwifery," by Dr. William L. Reid; "Anæsthetics in Dental Practice," by Dr. Woodburn; "Nitrous Oxide, Cocaine and other Anæsthetics," by Dr. W. J. Fleming; "Causes of Death Under Chloroform," by Dr. Beatson; "On Various Anæsthetics, with Special Reference to Methylene," by Dr. G. A. Turner; "The Chemical Aspects of Anæsthetics," by Dr. George Buchanan; "Experimental Observations and Inferences Relating to the Physiological Action of an Overdose of an Anæsthetic," . . . "Indications of Danger in Chloroform Narcosis," by Dr. David Newman; "The Administrations and Dangers of Anæsthetics," by Dr. James Dunlop; "Special Remarks on Ether," by Mr. H. E. Clark; "Anæsthetics in Diseases of the Heart," by Dr. Alex. Robertson; "Anæsthetics at the Children's Hospital," by Dr. Ness; "Anæsthetics in Practice," by Dr. Walker Downie; "Anæsthetics in Obstetric Practice," by Dr. Samuel Sloan. Besides the formal papers above mentioned, there are brief discussions by Dr. Murdoch Cameron, Dr. Renton, Dr. Hector Cameron, Dr. McConville, Dr. Carmichael, Dr. McGregor Robinson, Dr. Stirton, Dr. Lapraik and the president of the society, Dr. William Macewen. The society has shown a commendable desire to avoid redundancy in both the papers and the discussions, and their conciseness adds to their value. The results of the Hyderabad Commission are sustained, and in conclusion, Dr. Macewen gives the most cogent reasons for his adherence to chloroform, and while he clearly states his preference, is undoubtedly fair to the adherents of ether. He gives a statement of the dangers of ether in its after-results, in which bronchitis and pneumonia are mentioned. He

omits mention of the most serious of all, and that is, the fatal renal congestion that may follow the prolonged use of ether in cases of fatty kidney, or, indeed, in any stage of nephritis. In such conditions ether is, without doubt, wholly contra-indicated. The book as a whole is a worthy companion to the recent report of the Hyderabad Commission and the well-known text book of Prof. Lyman.

J. B. H.

NECROLOGY.

DR. JAMES K. THACHER, of Yale Medical College, died April 21, 1891, aged fifty-four years. He was the eldest son of the late Professor Thomas Thacher of Yale, and a graduate of that university in 1869. Ten years later he took his medical degree from the Medical Institute at New Haven. The interval had been filled by several series of original investigations regarding comparative anatomy and physiology; part of the time being, also, taken up by his duties as a college instructor. The Transactions of the Connecticut Academy of Sciences contained the results of his studies, which attracted the attention of the scientists in all parts of the world. He claimed that the limbs of the higher vertebrates were developed from the fins of fishes, a view sufficiently novel at the time he advanced it, but which has since been strengthened by later investigations. He became Professor of Physiology soon after graduating in 1879, and engaged in general practice. He received an appointment in the New Haven Hospital, and the chair of clinical medicine was added to that of physiology. He was one of the medical editors of the new Century Dictionary.

MISCELLANY.

MITCHELL DISTRICT MEDICAL SOCIETY.—The annual meeting of this Society will be held at West Baden Springs, Thursday and Friday, July 16 and 17, 1891.

Thursday, July 16. Morning session, 10 A.M. Calling Society to order.

1. Welcome to visitors, A. M. Owens, M.D.
 2. Greeting and welcome to visitors from other States, Edwin Walker, M.D., President Indiana State Society.
 3. Response, Kentucky and Ohio.
 4. Report of Society.
 5. Reception of new members.
- Afternoon Session, 2 P.M.
6. "Antiseptic and Aseptic Surgery," J. B. Duncan, M.D., Petersburg, Ind.
 7. "Excision of Varicose Veins," J. T. Freeland, M.D., Bedford, Ind.
 8. "Suicide," T. M. Kyle, M.D., Aurora, Ind.
 9. "Technique in Laparotomy for Diseases of the Tubes and Ovaries," W. H. Wathen, M.D., Louisville, Ky.
 10. "Inflammation," Chas. Knapp, M.D., Evansville.
 11. "Septic Infection of the Newly Born," Geo. T. McCoy, Columbus.
 12. Paper, A. J. McDonald, Bedford, Ind.

13. "Importance of Local Treatment in Scarlatinal Throat Affections," Thomas Hunt Stucky, M.D., Louisville, Ky.

Evening Session, 8 P.M. "Conversazionez."

Friday, July 17, 8 A.M.

14. "School Hygiene," T. F. Wood, M.D., Wertz, Ind.

15. "Puerperal Eclampsia," T. S. Galbraith, M.D., Seymour, Ind.

16. "Antipyretics," E. S. Elder, M.D., Indianapolis.

17. "Intestinal Obstruction, caused by an Abdominal Tumor with Twisted Pedicle, Laparotomy, Recovery," Thad. A. Reamy, M.D., Cincinnati.

18. "The Tampon in Rectal Surgery," J. M. Matthews, M.D., Louisville, Ky.

19. "The Best Method of Treating Fractures of the Femur," A. M. Owens, M.D., Evansville.

20. "Truss Treatment of Inguinal Hernia," J. W. Marsee, M.D., Indianapolis.

Afternoon, 1:30 P.M.

21. "Hypertrophic Rhinitis," T. C. Kennedy, M.D., Shelbyville, Ind.

22. "Management of Office Gynecological Patients," Edwin Walker, M.D., Evansville, Ind.

23. "Spinal Curvature," J. A. Comingor, M.D., Indianapolis.

24. "Granulated Lids," D. S. Reynolds, M.D., Louisville, Ky.

25. "New Methods of Treating Tuberculosis," Theo. Potter, M.D., Indianapolis.

26. "Limitations of Palliative Treatment of Enlarged Prostate," W. N. Wishard, M.D., Indianapolis.

Volunteer papers and case reports are solicited.

The management at West Baden Springs has made a rate of \$1 or \$1.50 per day (according to room) on account of those in attendance at this meeting. Season tickets are on sale at all principal railroad offices.

So far as possible, the Society will endeavor to accommodate those presenting papers to suit their convenience.

Officers of the Society: President—A. M. Owens, M.D., Evansville; Vice-President—H. W. Shirley, M.D., Shoals; Secretary—Geo. W. Burton, M.D., Mitchell.

THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS will hold its fourth annual meeting at the New York Academy of Medicine, 17 West Forty-third St., in the City of New York, Thursday, Friday and Saturday, September 17, 18 and 19, 1891, under the Presidency of Dr. Adam H. Wright, of Toronto. All physicians interested in the discussion of subjects pertaining to abdominal surgery, obstetrics and gynecology, are invited to attend without further formal notice. By order of the Executive Council.

WILLIAM WARREN POTTER, M.D., Sec'y.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from June 27, 1891, to July 3, 1891.

Asst. Surgeon Edward C. Carter, relieved from duty at Ft. Walla Walla, Washington, and assigned to duty at Ft. Canby, Washington.

Asst. Surgeon C. B. Ewing, U. S. A., is granted leave of absence for one month.

Asst. Surgeon J. O. Skinner, U. S. A., upon the abandonment of Ft. Davis, Tex., will proceed to Ft. Clark, Tex., and there take station.

Official List of Changes of Stations and Duties of Medical Officers of the U. S. Marine-Hospital Service, for the Three Weeks Ending June 27, 1891.

Surgeon J. B. Hamilton, ordered to Washington, D. C., on special duty, June 9, 1891.

Asst. Surgeon H. D. Geddings, ordered to New York, N. Y., on special duty, June 13, 1891. Ordered to Washington, D. C., on special duty, June 26, 1891.

Asst. Surgeon C. P. Wertenbaker, when relieved at Galveston, Tex., to proceed to Chicago, Ill. for duty. June 23, 1891.

Asst. Surgeon A. C. Smith, relieved from duty at New Orleans, La.; ordered to Galveston, Tex. June 23, 1891.

Asst. Surgeon W. G. Stimpson, ordered to New York, N. Y., for temporary duty. June 12, 1891.

Asst. Surgeon M. J. Rosenau, when relieved at Chicago, Ill., to proceed to New Orleans, La., for duty. June 23, 1891.

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ORIGINAL ARTICLES.

THE SCIENTIFIC RATIONALE OF MODERN WOUND TREATMENT.

Read in the Section of Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5-8, 1891.

BY HENRY O. MARCY, M.D.,
OF BOSTON, MASS.

The currents and counter-currents of surgical opinion, which dominate the methods of wound treatment, are perhaps nowhere better illustrated than at present in the public hospitals of London. In one of these the great founder of antiseptic surgery explains to his pupils and a very considerable number of surgeons, who gather daily in his wards from all parts of the world, the fundamental principles upon which his methods are formulated. These he exemplifies with painstaking care in the great variety of operations which are done in the amphitheatre of a large general hospital. It is noteworthy to observe that drainage is considered far less important than was earlier taught, although every wound is dressed with ample provision for protection from extraneous contamination, with the expectation that there may be, at least, a certain amount of serous or bloody fluid escaping from the wound, which must be prevented from becoming infected. Mr. Lister now feels certain that the double cyanide gauze is by far the best protective dressing that has yet been devised.

In Guy Hospital carbolic spray may be seen in daily use, as a still further protection during the dressing of wounds, which is usually done at the bedside in the wards. In another hospital all this is openly abandoned, and antisepsis is not only considered useless, but harmful. Here, however, it is noteworthy to observe that the so-called system of cleanliness, which is emphasized, is antiseptic so far as it is possible to destroy the septic material with which, in life, all individuals are usually surrounded and must necessarily come in contact. This pertains especially to the field of operation, the operator, his assistants and the material used by them.

In Birmingham the surgeon, most often heard from in unmeasured terms, scouts all the pro-

cesses pertaining to antiseptic surgery as "illogical and unscientific"; claims that even the vital tissues themselves in a state of health have ever present in them infective material, and that the dominating surgical thought of to-day is already an exploded fallacy, and that the system so elaborately constructed by Professor Lister is "as dead as Julius Cæsar."

In the great hospitals of Berlin there is a singular uniformity of method, revolutionizing all the work of the earlier days, both in technique and results.

In America, where individual opinion has its expression with the greatest degree of freedom, individuality is more noteworthy, and, although the teaching of surgery in the great centers of learning is largely based upon the fundamental principles as elaborated by Sir Joseph Lister, there is too often seen a carelessness of method, especially in detail, and corresponding imperfect result which indicates either a disbelief in or an imperfect knowledge of what, for my own part, I had supposed long since considered demonstrated.

It is wise and ever profitable analytically to review, with critical care, our own convictions and experiences. This is not alone philosophic, but in large measure the way in which advancement may be made, and oftentimes leads to the condemnation and abandonment of our own most cherished ideas, resulting in the adoption of new means by which to reach a given end. Only by such measures can the individual himself become progressive and keep apace with the tide of accumulated observations, with the assimilation of new truths, and himself become an important contributor to the advancement of science.

In this spirit, and not as a partisan, do I purpose to claim the attention of the section to a brief discussion of the scientific rationale of wound treatment, necessarily brief, since it were easier to write a volume than to attempt a correct presentation of the subject in the short time at my disposal.

So omnipresent is the appearance of vital activity in all organic material that we cannot wonder that it long went unchallenged as an inherent factor. The ever illusive search for the beginnings of life led to the belief in a spontaneous generation, under favorable conditions, and to the

solution of this problem we are first of all indebted, as the foundation of subsequent demonstration. Here Pasteur, Tyndall and many others of scarcely less note laid the foundations of a practical science as wide-reaching as humanity, the importance of which hardly dawned upon their perception. In this connection it affords me the greatest pleasure to pay tribute to one of my earliest and most loved teachers, the late Prof. Jeffries Wyman, of Cambridge. In the *American Journal of Science and Arts*, vol. 34, July, 1862, Prof. Wyman gave an account of some experiments on the formation of infusoria in boiled solutions of organic matter, the result of which was that such solutions, exposed only to air which had passed through iron tubes, heated to redness, became the seat of infusorial life; the same results followed when similar solutions were enclosed in hermetically sealed flasks, and subsequently exposed to the action, for a short period, of boiling water. In a few instances, infusoria appeared when the temperature was raised above 212° F.

He says: "All living beings found under the above circumstances have been attributed either, 1st, to organisms, or the germs of them, supposed to be contained in the fluid experimented with, or the air included in the flasks; or 2nd, to the direct transformation of organic matter into new living beings, independently of any germs, or living organisms whatever; or in other words, to 'spontaneous generation.' Abundant proof has been brought forward to show that the spores or germs of infusoria exist in the air in quantities amply sufficient to account for the presence of living organisms in solutions freely exposed."

"There can therefore be no certainty of the existence of spontaneous generation in a given solution, until it can be shown, that this has been freed of all living organisms which it contained at the beginning of the experiment, and kept free of all such from without during the progress of it. On the other hand, this kind of generation becomes probable, whenever it is made certain that infusoria do appear in solutions, in which the conditions just mentioned have been complied with."

For the purpose of determining whether infusoria can develop in organic fluids freed from living organisms which are kept secluded from atmospheric contact, Dr. Wyman entered into a long series of experiments with boiled solutions of organic matter in sealed flasks, which experiments were published in the *American Journal of Science and Arts*, September, 1867. The material used was the albuminoid product, usually boiled and filtered beef juice. The experiments were twenty in number and each usually consisted of a series of flasks, subject to a great variety of exposures. The contents of the flasks were afterward carefully studied by himself and Prof.

Henry J. Clarke, and the different varieties of bacteria were diagrammed, as seen under the microscope, enlarged from two to four thousand diameters. Prof. Wyman arrived at the conclusion, that at the temperature of boiling water, when continued for a sufficient period, the organic solutions contained in the flasks were completely sterilized, and that no matter what the surroundings or conditions, the fluid remained sterile until again brought into contact with the atmosphere. Under recent date, Dr. Morrill Wyman, of Cambridge, brother of the late Professor Jeffries Wyman, wrote me that some of the flasks used in these original experiments still remain with contents free from any evidence of life.

These original researches by one of America's most distinguished investigators are worthy of permanent record in the relation which they bear to antiseptic surgery. It seemed but a logical sequence that the introduction of these low forms of organic life into the albuminoid secretions of wounds would there germinate and be the legitimate cause of subsequent decomposition, producing all the train of evils incident to suppurating wounds.

Having once demonstrated that the cause of decomposition in organic fluids was due to an extraneous something, usually everywhere present, and that *that something* consisted of certain definite forms of life introduced into them from without, these factors were plainly applicable to the treatment of wounds, and in this commenced the monumental labors of Mr. Lister.

The question, naturally, soon broadened out to determine, if possible, the varieties of bacteria which develop within the organism during the life of the higher animals, the peculiar conditions incident to their growth, and if certain varieties were more harmful than others. In other words, it became necessary to study *de novo* certain chapters of natural history, involving several families of the lowest orders of plant life. All this is now recognized as so important that bacteriological researches, from the standpoint of laboratory investigations, are included in the curricula of all the better equipped universities. These additions having been made to science, it naturally followed that, when the conditions of bacterial reproduction were known, it was then, and not *until then*, that the investigations of changed relationships which would limit, restrict, or prevent, their development could be intelligently undertaken.

Many of these investigations have borne fruitage of the greatest value to the human race. We now have the scientific demonstration of this in man, in the easy control of small pox by vaccinia, established by the immortal Jenner, in the lower animals, in the valuable illustration of the same teaching by Pasteur in chicken cholera, and in the more recent and by far more important

original investigations and demonstrations by Dr. Frank Billings, of Nebraska, in the limitation and control of hog cholera.

Very naturally this line of research has been extended, until it may be accepted as demonstrated that the large share of contagious and infectious diseases to which the human race is liable, are due to the introduction within the organism of a variety of spore plant growth, the development of which is the causative agent of the given disease. I need only to refer to the oft-repeated and generally accepted demonstrations of these important truths as illustrated in anthrax, cholera, tuberculosis, pneumonia, diphtheria, typhoid fever, measles, scarlet fever, etc.

Although quite a variety of other forms of growth may be introduced into the human system and germinate to the production of disease and death through the medium of an open wound, as for instance, anthrax, or diphtheria, it was speedily demonstrated that the poisoning of wounds was chiefly due to the micrococcal or round-celled growth. It was shown that these could be isolated, cultivated artificially, that they bred true, and upon reintroduction into wounds they always produced the same general class of symptoms and poisoning. Familiar illustration of this is found in erysipelas.

To show the fallacy that all organized material possesses in itself the means by which decomposition may go on spontaneously, a, so-to-speak, inherent bacterial infection of low order, the early experimental observations of Prof. Wyman already alluded to, then demonstrated that the vital organisms contained in organic fluids were destroyed by the simple process of prolonged boiling, or by a retention for a considerable period at the heat point not above 212° F. A much more simple series of experiments unquestionably show that organic fluids, introduced into sterilized flasks without bacterial contamination, do not undergo decomposition, although freely exposed to atmospheric contact, provided that there is a protection of a slight packing of sterilized cotton which serves to filter out the germs of decomposition commonly present in the atmosphere. This is easily demonstrated in urine or blood exposed to very considerable elevations of temperature, and these highly organized fluids remain sterile, unchanged indefinitely. The exposure of these same fluids to the atmosphere of a common living room, by the simple removal, for a few minutes, of the cotton protective, is sufficient to cause a rapid decomposition to ensue by the development of atmospheric germs coming in contact with them. This is shown to be a fundamental fact, pertaining not only to the fluids of the body, but equally also to the organized tissues, when treated in a manner that shall exclude from the same the extraneous germs of decomposition.

In reply to an able and exhaustive argument

by Professor James L. White, of Philadelphia, upon the present position of antiseptic surgery, Mr. Tait, of Birmingham, publishes in the *British Medical Journal*, February 14, 1891, a defense of his position, from which I am constrained to make an extract, since Mr. Tait is so often quoted as an authority to prove the uselessness of what is called the antiseptic system of wound treatment: "Fortunately for my present purpose, Prof. White puts the issue syllogistically, and formulates for both of us a major premise upon the truth or error of which depends the whole conclusion; and I accept this issue freely. I say that germs of decomposition exist already in the blood and elsewhere in the body and are ever present, but do not bring about their results till death, or some condition which we may call a tendency to death, gives them permission so to do. Professor White says that the elaborate and carefully conducted experiments of Houser, Watson, Cheyne, and others completely contradict the statement 'which is really the foundation of Mr. Tait's argument.' In reply, I say I care not a straw for elaborate and carefully conducted experiments, no matter at whose hands, when their conclusions are diametrically opposed to every day experience." . . . "In truth the facts of the housekeeper and the henwife are far more scientific, that is, far more exact than those of our biological experimenters. They are in harmony with what I see in my work every day and therefore it seems to me a perfect waste of time to follow Professor White beyond his own major premise, which is utterly mistaken."

It may be accepted that the proof of the mistake in the major premise, as based upon such demonstrations, will not be received by the profession, as scientific, or determined, and to me it seems, in large measure, a waste of time to attempt to refute them. Really the housekeeper bases the entire art of preservation of all her organic compounds upon the demonstrations of Professor Wyman, already referred to. Upon these has developed the preservation of the food products, by the canning system in use in the various parts of the world. In America the meats of Texas, the fruits of California, the salmon of Alaska, are familiar illustrations of great economic commercial value in supplying our daily wants, giving employment to thousands of people and furnishing a product of an annual value of millions of dollars.

We might broaden the inquiry to the natural decomposition of fruits and vegetables, including all the grains. Break the epidermal cells of the skin of the grape, the orange, pear, or apple, and all know the rotting of the fruits by the rapid development of a low order of new growths. All the starchy seeds, bulbs, and grains, are protected by an impermeable envelope during their so-called sound state. There is no vital force which

holds in preservation these starch cells, they are simply stored up, like the albuminoid products of the egg, to serve as food in the development of the germinal cells in the earlier stages of reproduction, until the plant has reached a stage of evolution with sufficient inherent power for an independent existence.

If I understand at all what is meant by the demonstration of the henwife, it is simply this and nothing more, that the vitalized ovum is surrounded by a mass of nutritive material, enclosed for its better protection in a porous casement of lime salts, which albuminoid material contained therein is utilized for the development of the growing chick and dominated by vital forces, which elements become parts of a vital organization in precisely the same manner as when the independent individual utilizes its food, which in later life is received into the organism through the alimentary canal. The chief difference that pertains in the characteristics of the growing organism, is that in the oviparous animals the nutriment necessary for the development of the ovum is emitted in a mass sufficient for the purposes of the economy of complete development, while in the mammalian vertebrates the foetal nutrition, by the process of secretion and absorption, is elaborated *pari-passu* to meet the necessities of the growing organism. In the one instance, the egg, when devitalized, speedily undergoes bacterial decomposition, introduced through the protecting envelope from without. In the other, as Mr. Tait should well know, the foetus, having perished within the uterus, undergoes a process of maceration, but never decomposition, unless by the introduction of germs from without. Therefore, it is evident that Mr. Tait's major premise, as he understands it, based upon the scientific deductions of the housekeeper and henwife, are subject to revision, and indeed, when carefully studied, are strictly in accord with the scientific observations, as daily conducted in our better laboratories.

The problem confronting the surgeon is easily subdivided into the two chief factors viewed from the aspect of strict science. The first factor, based upon the accepted premise which I am sure few would have the hardihood to consider "illogical and unscientific," that the vital organism with which surgery has to deal is, itself, in health, free from bacterial ferment, protected from without by a coat of mail, when unbroken impermeable to invasion, and from within through its mucous surfaces by a similar disposition of protective cells, is that all operative wounds made in such tissues should be, as far as possible, made and maintained aseptic; the second, when septic, to determine the best measures for the destruction of the infecting organisms. The wounds of the first class are liable to extraneous infection from everything with which they may come

in contact, and hence the necessity for sterilizing the surroundings and the material applied. It is sufficient for our present purpose to omit reference to the manipulative detail, as to the means to be used to secure this end. I cannot myself doubt, but that the justly discarded and much abused carbolic spray, in the earlier stages of the problem, served as a valuable means in securing good results. Irrigation serves a far better purpose and in the present state of our knowledge cannot safely be dispensed with. A wound in uninfected tissues should be aseptic, as far as possible freed from devitalized structures, carefully approximated, and held at rest. It should be maintained aseptic by the application of suitable dressings.

The second factor of the problem is a much more difficult one. How to treat a wound made in tissues which are already infected, or to best care for a wound which has by accident become the seat of septic ferment, is a subject upon which there is great difference of opinion. Anything like a satisfactory discussion of the problem confronting us demands the careful study of the varying conditions of the individual, the vital, resistant power of the infected organism, as well as the character and amount of the infection itself. The individualistic resistant force is a constantly fluctuating factor, naturally greater in young life and lessening in accordance with age, surroundings, habits, etc. Bacterial growth in dead tissue, under favorable conditions, goes on to the entire decomposition of the material.

When introduced into the living tissues in small quantity, although the heat point and albuminoid products for its food are ever present, the vital, resistant power of the organism may be such that the bacterial ferment will not germinate at all, or in such a limited degree that at the most the disturbing conditions are strictly local and soon disappear. Under favorable circumstances, the resultant suffering and danger are in direct ratio to the amount of the infected material introduced into the organism, and this may be in such quantity as to entirely overcome the resistant power and rapidly cause its destruction. The character of the seed introduced also varies greatly, the reproducing power of some ferments, as anthrax, being such as no matter how small the quantity greatly to endanger the individual. Not seldom the prick of a needle, carrying a minute portion of bacterial infection from a dissection wound, may introduce a virus into certain localities, where its rapid reproduction produces speedy death, while many of the atmospheric germs, common to all localities, reproduce only feebly under the most favorable conditions and soon disappear.

In tracing out the processes which a healthy organism has at its command, it is of intense interest to note the manner in which Nature rallies

her forces for resisting invasion. The profession have long been familiar with the rapid proliferation of cell character which goes on about a wound, and these changes have been more or less carefully studied from the beginnings of surgery. My earliest teacher in medicine, the late George A. Otis, Surgeon of the United States Army, whose monumental labors in the elaboration of the surgical history of the late War of the Rebellion won for him enduring fame, emphasized the observation that the so-called pyogenic membrane in abscesses was in reality protective to the surrounding parts and was not to be interfered with by surgical manipulation.

We now know that the leucocytes, so familiar to all versed in histological study, are endowed with a peculiar physiological power. One of the first processes which we are wont to observe under the name of inflammation, we find consists in a rapid proliferation of the white cells about the point of invasion, encapsuling, as it were, the foreign material. That they do more than this, having the power to surround and destroy, so to speak, under favorable conditions to digest the bacteria is now generally well known, thanks to the observations of Metschnikoff. Although it is quite too early to draw general deductions from these facts and declare that the entire solution of the so-called vital, resisting power of the tissues lies in this power of the leucocytes, there is every reason to believe that this important discovery gives an explanation of satisfactory type to certain of the hitherto unexplained factors in the repair processes of wounds. In the repair of the minor subcutaneous injuries we have familiar illustrations of the part which the leucocytes play in the animal economy. The effused blood is surrounded by them, and the material of the exudate is appropriated for their own development. Minute capillary vessels are formed in the line of these invading cells and the process of clot disappearance and granulation tissue development go on *pari-passu* until the clot has disappeared and new connective tissue restores the part to its former condition.

When a small colony of micrococcal cells have found lodgment, the leucocytes surround and shut in the enemy, until a wall of living granulation cells are formed, forcing it to surrender, and a localised abscess is the sum total of damage.

If we find in these familiar leucocytes the so-called phagocytes of Metschnikoff, empowered to a certain extent with the ability actually to destroy infecting bacteria, we certainly have in a very considerable measure an explanation of the vital resisting power of the individual organism. If, under favorable circumstances, these canabalistic little workmen, not alone surround, but actually eat up, their enemies, we have the best of reasons for understanding why the comparatively

few germs in the atmosphere of an healthy locality are far less dangerous to wounds than was earlier supposed.

Again we understand why in the so-called surgically clean wound, a wound where great care is taken to exclude foreign material, and the comparatively uninjured clean-cut surfaces are closely approximated, the reparative processes go on steadily, and rapid recovery supervenes, although in a strictly scientific sense, the wound may not be aseptic. The infected organism suffers in a two-fold manner. First, locally, that is, in the wounded surface and its immediate neighborhood, and in a general constitutional poisoning. The latter is produced by a chemical substance capable of isolation, called sepsin. This may in itself be sufficient to cause death, and its importance can hardly be overestimated, but since it is the direct result of microörganic development, it follows that the control, or destruction, of the organic ferments is the sure way of cutting off the septic, systemic suffering.

In this process, the methods which have been emphasized as aseptic, or surgical cleanliness as in contra-distinction to antiseptics, bear no part except so far as they may aid in removing the products of decomposition. The prerequisite knowledge in this instance must be sufficient to enable the best trained surgeon to make use of those agents best fitted to destroy the organisms *in loco* with the least possible injury. Hence the wide field of research of a most painstaking and scientific character which must of necessity be traversed before a satisfactory solution of this question could be given. Now, we have the fruitage of a multitude of patient investigators; notably Mr. Lister and Mr. Cheyne, of England, Pasteur in France, Koch in Germany, Sternberg, Cabot and others in America. My own publications upon this subject were the fruitage of two years of carefully conducted laboratory experiments.

The mercuric-bichloride solutions are usually greatly to be preferred as more effective as a destroyer of infection and less irritant to the wounded surface. All pockets in suppurating wounds must be carefully cleansed and drained, while in iodoform we fortunately have an agent, the crystals of which are only in a minor degree irritant, and as such absolutely non-poisonous. They dissolve very slowly and are germicidal only in solution. Hence by their use bacterial development is greatly retarded, if not altogether prevented. The iodoform crystals in most wound secretions, as ordinarily observed, dissolve so slowly that the antiseptic power is continued as a constant factor for hours, sometimes even for days together.

From this hasty, and necessarily imperfect, review of a subject second to none in interest or importance to our entire profession, we have

omitted of necessity very much of value. However, I am certain that "the better methods of wound treatment have a fundamental basis of a strictly scientific character, the three important factors of which are: *First*, the vital resistant power of the individual. *Second*, the character and amount of the bacterial infection. *Third*, the local condition of the tissues at the seat of implantation. ■

The ideal treatment of wounds is certainly the restoration of the condition of the parts operated upon to, as nearly as possible, their primal state. If this can be effected aseptically, then there are no bacteria to be removed, and if the wound is surgically clean, with accurate coaptation of the sundered parts, then the vital forces are sufficient to utilize any resultant exudates, and drainage is not alone superfluous, but harmful. The reparative process should go on under a dressing which will permit of the introduction of no foreign factorage. The various antiseptic dressings now so generally used, have a value in wounds necessarily drained, that is subject to a probable infection, but in aseptic wounds primarily closed, they are unnecessary, expensive and cumbersome."

For quite twenty years I have been in the constant practice of closing *aseptic* wounds by lines of buried animal sutures. Little by little I have been led to discard drainage, almost without exception, in this entire class of wounds, until I have formulated it as a rule of practice, that no matter how large or deep in non-infected structures, the sundered parts are rejoined, oftentimes by the use of several feet of tendon suture, and the wound is sealed by a germ-proof dressing of collodion. To this rule the larger amputations are no exception, and such wounds thus treated rapidly heal without pain or œdema of the coapted tissues. In reality, it makes little difference by what name we call this modern miracle of surgical wonder-working. It has its establishment upon the foundations of pure science, its future gives promise of still greater achievement, and we may look forward with confident expectancy to the day when medicine and science, although they cannot be exact sciences, will be understood and practiced with a scientific rationâle above contradiction or reproach.

My brethren of a noble profession, second not even to that of the clergy, may I not be pardoned a digression? We have spent the last two days in the Councils of the Academy of Medicine intent upon the purpose of elevating the profession to a higher standard of education, comparing the advantages of a general, with those of a technical training. May we not accept that they both should be broadened in the Catholicity of science which is after all the demonstration of God's own law of pure and simple truth? The one profession reads it in the Divine revelation

transmitted through the Fathers; the other is the unerring law of vital forces transmitted from the beginning of creation. The one teaches a mediatorial redemption from the transgressions of the moral law; the other knows of no high-road cast up for the escape from the penalties attached to the infraction of its inflexible government.

Since both emanate from a common source and center of Being, should they not be at least equally respected, investigated and obeyed? He who studies the infinitely minute, and yet sees through it all the marvelous working of a vital law, intended primarily for the beneficent good of the created, is moved by the same divine inspiration as he who measures the infinities of space and weighs the distant stars in balances of mathematical correctness. If I read aright the doctrines of our great republic in the evolution of our race, the time is not far distant when the necessity of sending our young men to the great centres of European thought for a higher development in the training and knowledge of the exact sciences will have passed.

Let our own central government not alone foster the education of the masses as a bulwark of defence in the protection of our own inherent safety, but let her also provide national laboratories which shall amplify the advantages of the Carnegie and John Hopkins institutions for biological researches, the advantages of which to our entire race can hardly be overestimated.

EMBOLISM OF A BRANCH OF THE PULMONARY ARTERY. PATIENT SUSTAINED BY OXYGEN GAS. RECOVERY.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D.C., May, 1891.

BY GEO. E. FELL, M.D., F.R.M., Sy.,
LATE PRESIDENT AMERICAN SOCIETY MICROSCOPISTS, PROF. PHYSIOLOGY AND MICROSCOPY MED. DEPT., NIAGARA UNIVERSITY, BUFFALO, N. Y.

One of the remarkable conditions associated with the blood vascular system is, that with all the radiations of the capillary system, we have so little disturbance in the blocking of these minute channels. It is true that without some external influence acting on the coats of the vessel, or some modification of the blood, or walls of the vessels through and by which the fibrin factors are disturbed in their normal relations, we could not readily ascribe a cause for the accumulation of any substance which would block or disturb the activity of the circulation. We do, however, have modifications of the blood, as in albuminuria, which appears to permit such abnormal changes to exist, so that the fibrin forming factors take on an abnormal state, with the conse-

quence of the formation of a greater or less amount of fibrin, resulting in a clot. The size of this clot, of course, has a very great bearing upon the prognosis in these conditions. In the pregnant state, with albuminuria preceding labor, we have just such a condition existing whereby the excessive strain upon the uterine vessel, and the more or less mechanical effect produced by the passage of the foetus, we may have the vessel so disturbed that a clot may readily form. The history of the subject gives us the authority to state, that emboli do form, and frequently to a very great extent, so that the functions of important vessels in various parts of the organism are interfered with, thus disturbing to a greater or less degree the physiological relations of the parts affected. It may be stated in passing, that clots of so large a size have been formed that on entering the right side of the heart they have immediately disturbed the function of this organ so as to produce immediate death.

When the embolus passes into the pulmonary artery so as to completely occlude this important vessel, of course death must immediately ensue. However, we may have many conditions existing wherein only portions of the vascular area, to which this important vessel is distributed, are disturbed, and I now have the pleasure of being able to report a case in which all the evidences point to such a condition. Before, however, entering upon the details of this case, we will refer briefly to the results of emboli forming in various parts of the body. The result of the occlusion of a small artery is simply told in the following words, modified from Coles' Histology.

"In embolism a small mass of coagulated blood or fibrin, a small mass of tissue separated from an organ by ulceration (endarteritic modifications), some extraneous matter penetrating into the vessels in some way or other and carried away by the blood stream, on reaching the small branches of the arterial system, become impacked and suddenly interrupt circulation for a time in the area supplied by the vessel plugged. In the same manner thrombosis and the addition of coagulum products would cause more or less complete anæmia of the area supplied by the obliterated vessels. The effects of the occlusion of arteries which do not freely anastomose with other arteries of the same size, so-called terminal arteries, are simple to understand if we keep in mind the way in which blood circulates through an organ thus supplied. The blood passes from an artery into smaller arteries, and finally into arterioles. These arterioles end in a plexus of capillaries (or in the lungs in the wonderfully minute ramifications in the air vesicles). From these capillaries veins corresponding with the arteries originate, but although a terminal artery does not anastomose with other arteries, the capillary plexus belonging to it is continuous with

the capillary plexus corresponding to neighboring arteries. "When one of these arteries is obstructed from some cause or other, the first effect is the stoppage of the flow of blood through all its branches, and in the lungs, consequently, a less area of respiratory surface is produced." The blood remains nearly stagnant in all the area supplied, except at the periphery where the capillaries join to adjacent arterial systems. A very slight amount of blood penetrating through these collateral vessels into the stagnant area; blood still passes very slowly from it into the corresponding vein, but the circulation is so sluggish that the walls of the vessels lose their vitality by degrees, and consequently their tone. They become more or less distended, and in this stage the infarct may assume the appearance of a hæmorrhagic block. However, stagnation is soon followed by coagulation and complete arrest of blood flow, and in organs like the kidneys, liver, brain or spleen, the tissues and the blood itself degenerate as the functional and organic circulation are associated in the same vessels. "In the lungs, however, owing to the bronchial vessels supplying nutrition, there is less tendency to necrotic changes. In the former organs the blood becomes granular and discolored." At the periphery of the infarct other phenomena take place. They are due partly to the increased blood pressure in the collateral vessels resulting from the increased supply caused by the obliteration of one of the channels through which the blood had to pass, and partly (and probably chiefly), to the modified and sluggish state of the circulation in the capillary zone common to the system of the obliterated artery and that of the neighboring arteries. In that zone of sluggish circulation leucocytes accumulate in the vessels, diapedesis takes place and causes infiltration of the tissue. Small hæmorrhages are very common, and the tissues are in a low inflammatory state. It is evident that part of this zone belongs to the area supplied by the occluded artery; and in sections of hæmorrhagic infarcts it is easy to demonstrate that this zone is supplied by the collateral capillary circulation."

This description of the action of an embolus refers to the kidney structure, and it will apply equally well to similar conditions existing in branches of the pulmonary artery. In the latter case we have the circulation cut off to a greater or less extent from the air vesicles supplied by the occluded artery and its branches, thus disturbing, according to the extent of area affected, respiration to a greater or less degree. If the blood cannot pass through the air vesicles of a sufficiently large area, dyspnoea is at once produced. In addition to this, owing to a lessened area of respiratory surface, cyanosis may ensue also to a greater or less extent. It is of course easy to imagine conditions in which the area of

disturbed respiratory surface is so small that the respiratory function is not interfered with to such a degree as to be inimical to life. The grade of disturbance, as stated, may vary between that condition which produces sudden death, and that which produces but a temporary disturbance to the system. In the latter case we may imagine the infarct to have been small in extent, and the changes taking place in it being of such a character that it is absorbed, thus doing away with any serious results supervening through its presence. However, the case which I will relate to you to-day, was of a very serious nature, and only through the happy thought of supplying the patient with oxygen was the decreased respiratory surface enabled to supply sufficient oxygen to the blood to retain the vitality of the system. The value of the treatment cannot be gainsaid. Had oxygen not been used, the result would have been fatal within a very short time, and another case would have been added as the result of embolism following child-birth. How many cases which have occurred in the past might have been saved by the prompt administration of oxygen, of course cannot be surmised, but its evident value was so clearly marked in this instance that it will always be one of the important agents to be recommended in similar cases. Where cyanosis exists oxygen should always be supplied either through the administration of the pure atmosphere, as in cases of paralysis of the respiratory centers, or in cases where the amount of oxygen passed to the lungs is diminished in quantity. An instance of the latter was furnished in a case of membranous croup which occurred with a patient of Dr. Dorr, on Fillmore avenue, this city, in which I suggested oxygen. In this instance, while we did not have a decreased area of respiratory surface, we had a diminished amount of oxygen supplied through the plug of mucus, or membrane, in the trachea. The oxygen administered made up for the loss of air passing into the lungs, and I believe Dr. Dorr will bear me out in stating that his patient's life was saved by the excess of oxygen administered over that ordinarily present in the atmosphere.

In the case of embolism, we had a decreased respiratory surface, and through the supply of oxygen we were enabled to permit this decreased surface to supply sufficient oxygen to keep up the life of the system.¹

Friday, March 3, 1891, about 2 P.M., while engaged in my office work, I was called hurriedly to attend Mrs. J., a sister of an intimate friend, and was informed that Dr. R. L. Banta, the attending physician, desired me to consult with him. I was informed by the brother and hus-

band of the lady that it was a serious case, and accordingly turned my patients out of my office, and hurried to the residence of the patient. On arriving at the house I found the patient in a hazardous condition; dyspnoea very great; cyanosis marked. Dr. Banta, however, was not present. I asked for him, and was informed that he would return in an hour or two. Seeing that the case was one calling for prompt action, and making a diagnosis at once, I sent my carriage with a prescription for oxygen gas, and made no attempt to relieve the patient; as little seemed to offer that could be of service. Within a short time a 40-gallon cylinder of oxygen arrived, and I immediately administered oxygen to the patient. The result was most satisfactory. The relief was immediate so far as the cyanosis was concerned. Dyspnoea, however, continued; rapid heart action and respiration, indicating a diminished area of lung tissue in condition for respiration. From subsequent conversation with the patient, the location and the cause of the trouble were defined. She said: "I could put my finger right on the spot where the trouble existed." Following this the area of the disturbance increased so that a greater portion of lung tissue was involved, and the patient was unable for one or two days after to specify the particular point of disturbance, that is, so far as consciousness would permit. More oxygen was procured. A 100-gallon cylinder was obtained, and about 5 P.M., some three hours after my arrival, it was found necessary to use this, the first cylinder having been depleted. The very short time which elapsed in changing the inhaling apparatus from one cylinder to the other, was sufficient to produce general cyanosis, and I hazard the opinion that at this time the patient would not have lived 30 minutes without oxygen. If in one minute deep cyanosis was produced, I think we have reason to believe that death would have ensued in thirty.

While changing this cylinder Dr. Banta appeared upon the scene, and I found by this time that he had not called me in consultation. He showed considerable surprise at my presence, and deemed himself unjustly treated, not having been notified in fact that a consultation was called. Upon explanation, however, that only on being informed that as physician in charge he had called me in consultation, was I present. To obtain my presence I had been deliberately misinformed. He very graciously accepted the situation existing, approved of the use of oxygen, and together we endeavored to make the best of it, both remaining at the house of the patient through the entire afternoon and night. At no time Friday night or Saturday morning could the patient be left without the oxygen without great discomfort immediately ensuing. Through Saturday the condition remained nearly the same, although with a gradual improvement. Every hour

¹ Five or six physicians who saw the case in the first 48 hours gave a fatal prognosis, with which the author agreed until the wonderful effects of the oxygen gas and subsequent treatment changed his views.

duration of the case gave us reason to hope that what had been prognosticated by five or six physicians in the first few days as a fatal case, might yet possibly result in recovery. Through Saturday night the case progressed favorably, the gradual improvement continuing so that the patient was enabled to breathe for some little time together without the aid of oxygen. Sunday the area of disturbance of lung tissue was increased to its greatest extent, and Sunday afternoon and night the improvement was evident, although the rapidity of the pulse and respirations kept up, so that it appeared the system would be unable to resist the great strain to which it was being subjected. Sunday night, however, the improvement continued, and Monday morning the patient presented a condition calling for an uncertain prognosis, but yet, as life had existed so long, there was reason to hope that changes might ensue in the infarct which would permit the lungs to resume their normal relation. The area of disturbance included, in its greatest extent, probably about one-third to two-thirds of the whole area of the respiratory surface of the right lung. This was indicated by a slightly œdematous condition of the lung tissue. At no time was the disturbance marked in the left lung, the respiratory murmur being distinct throughout its entire area.

Some strong points in evidence of embolism in this case, were the defined circumscribed disturbance at the beginning of the trouble, the increased area of disturbance gradually following the occlusion of the branch of the artery; the rapidity of the heart action, and of respiratory action,—the former ranging from 170, the first day of the condition, to 150, 140 and 130, upon the third and fourth days,—the respiratory action remaining during the occlusion of the area of respiration of the right lung, at about 50 for several days, decreasing to 40, and then gradually coming down to 30, 24, and to nearly the normal respiratory action about one week following the onset of the trouble.

The patient during the first week of illness was unable to lie upon her left side, or upon the back, with any degree of comfort. The first four days the slightest attempt to lie upon the back, or the left side, was followed by immediate dyspnoea—all these conditions indicating the correctness of the diagnosis, and precluding any favorable argument in support of a purely nervous disturbance, as has been suggested by one of the physicians only who was present during this interesting case.

The lacteal secretion, the locheal discharge, and many of the conditions, or features, following ordinary childbirth, were absent during the five days following the confinement. Albuminuria existed to a greater or less degree for a fortnight following confinement. The absence of

the locheal discharge was considered of so serious a nature that steps were taken to irrigate the uterus. These measures resulted in establishing the flow, and benefited the patient to a great extent. As stated, the patient was unable to lie upon any other than the right side, or upon the back. The irrigation of the uterus was therefore an interesting problem, and the method which I have long used and first reported to the Buffalo Obstetrical Club and which was published in the Transactions of the New York State Medical Association, Vol. 6, 1889, the latero-dorsal (not Sim's position) came into play in a remarkably interesting manner.

The patient was placed on the left side of the bed, lying upon her right side in the Sim's position. The speculum was introduced, and the irrigating tube passed into the womb. The knees were then raised as described in my article, thus permitting the outflow to pass into receptacle provided for it, and the womb was thoroughly irrigated, with the result that immediately the patient was improved, and in two days the locheal discharge was presenting in its characteristic manner. At this time, as stated, no milk was present. On using the breast pump, applied with Allen's surgical pump, and considerable vacuum, a serous discharge, very small in amount, would pass from the nipples. This treatment was kept up day after day, and followed by mild faradization; and within a few days the glands were secreting milk; and within a fortnight from the time of confinement, the mother had the satisfaction of being able to nurse her offspring.

I am glad to be enabled to report a case of this kind, and one which may have a far-reaching influence, resulting in the saving, possibly, of many mothers whose lives might be sacrificed were it not known that in oxygen gas we have an agent which will tide over often, as it did in this case, conditions which would prove fatal without it.

On the Monday following confinement, three days after I first saw this case, a Dr. E. was called, and suggested the addition of nitrous oxide, with what may be looked upon as favorable results. However, I do not consider it probable that the patient, who had been kept alive more than three days with the oxygen, and had used about 1200 gallons of the gas, would have made any the less a good recovery had the nitrogen not been introduced. This physician also stated that the patient was being burnt up by oxygen, but as her temperature at no time was above 99° F. there could be no grounds for such a statement, and the lady's recovery can alone be ascribed to the use of oxygen gas and the treatment instituted to overcome the albuminuria.

Among working men venereal disease is rare in Paris. Thus a late examination of about twenty-five hundred railroad employés showed but three cases of such disease.

TREATMENT OF POSTERIOR FACE PRESENTATION.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, at Washington, D. C., May, 1891.

BY EUGENE P. BERNARDY, M.D.,
OF PHILADELPHIA, PA..

Face presentations are rare, and as a result their mechanism and treatment are not always set out clearly by the different writers.

Dr. A. Charpentier gives the following statistics of face presentations :

Mme. Lachapelle, in	15,779 labors,	72 times.
P. Daboïs	2,022	11 "
Braun	7,835	44 "
At Wurzburg	8,514	58 "
At Gottengen	7,104	29 "
Depaul	16,233	33 "
Pinard	81,711	330 "
Total	139,198	577
Average, 1 in 241.		

Churchill's statistics for face presentation for British, French and German practice are as follows:

British practice :

Dr. Jos. Clark . . in	10,387 labors,	44 times.
Dr. Merriman . . .	2,947	10 "
Dr. Granville . . .	640	1 "
Dr. S. Cussack . . .	701	3 "
Dr. Mansell	839	7 "
Dr. Thos. Beatty . .	1,184	4 "
Dr. Collins.	16,414	3 "
Mr. Gregory	691	2 "
Dr. Reid	3,250	15 "
Mr. Lever	4,666	24 "
Total	41,719	143
Average, 1 in 291 2/3.		

French practice :

Mad. Boivin . . . in	20,517 labors,	74 times.
Mad. Lachapelle. "	15,652	65 "
M. Ramboux . . .	491	3 "
M. Daboïs	10,742	30 "
Total	47,402	172
Average, 1 in 275 1/2.		

German practice :

M. M. Moschner and Kursak . . . in	12,329 labors,	122 times.
Dr. Carus	2,557	24 "
Dr. A. E. V. Siebold "	1,003	10 "
Dr. E. E. V. " " "	494	4 "
Dr. Kilian	9,392	122 "
Dr. Merrem	157	1 "
Dr. Naegelé	115	4 "
Dr. Klugé	799	6 "
Dr. Brunetté. . . .	100	2 "
Dr. Ademan	57	1 "
Dr. Jansen.	13,365	15 "
Total.	40,765	311
Average, 1 in 129 2/3.		

It would seem strange that the larger percentage of cases occur in German practice, excelling in number those of the British and French, but why it should be so is unaccountable.

Charpentier's statistics give 577 face presenta-

tions in 139,198 confinements, or 1 in 241 cases.

Churchill's statistics give 626 face presentation in 129,489, or one in 206 3/4. The statistics together give us 1,203 face presentations in 268,677 labors, or 1 in 223 and a fraction of cases.

The causes of this form of presentation are as numerous as are the opinions of the different authors and writers, the obliquity of the uterus predominating as one of the essential causes. Deventer makes the following statement: If the uterus be inclined to the right side and the head or vertex be in the left occipito-iliac position, the uterine contractions taking place in the direction of the uterine axis after the membranes are ruptured, will force the foetus from above downwards and from right to left, so that the vertex will strike against the left border of the superior strait; the head, thus arrested, will be thrown back upon the posterior plane of the child.

Baudelocque, while admitting the right uterine obliquity, believes that at the same time a right occipito-iliac position of the vertex exists.

Dr. Charles D. Meigs, the first American writer that seems to have thoroughly understood and described face presentations, writes, "The cause of face presentation is not perfectly well understood; it is, however, probable that they are more commonly occasioned by an obliquity of the womb than by any other cause."

Leishman says: "The causes which lead to this unusual occurrence are not well understood, but the initiary movement which results in the position, can only be, as is obvious, a movement of extension, which at an early stage of labor, or prior to its occurrence, is substituted for the usual movement of flexion occurring during labor in the ordinary positions of the cephalic extremity; in other words, and to take the most simple view of the matter, cranial are converted into facial positions by a simple movement of the head on its transverse axis.

It will be seen with what doubt the above theory is advanced. Be the cause or causes what they may, either simple or complex, the fact remains that we have to deal with a premature extension of the head.

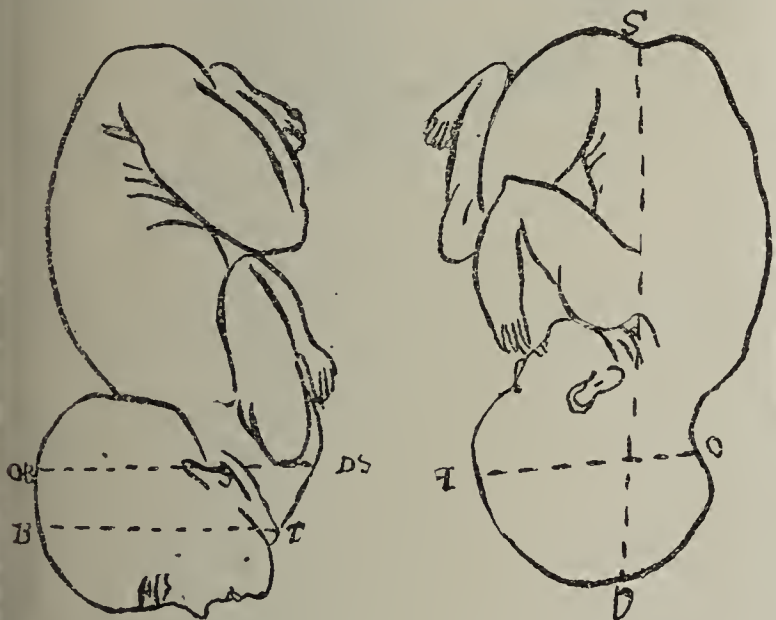
It is remarkable what diversity of opinion different writers have, in regard to the mechanism and treatment of this class of presentation. Many simply state that face presentations have the same mechanism as the vertex, the diameters are of the same dimensions and therefore must go through the pelvis in the ordinary manner of a vertex, an undoubted error. Other writers look upon a face presentation as unnatural labor demanding prompt interference. One author dismisses the subject in just 4 1/2 lines.

In 1876, Prof. R. A. F. Penrose¹, of the Medical

¹ Penrose on the Treatment of face presentations. American Supplement to the Obstetrical Journal of Great Britain and Ireland. April, 1876.

Department of the University of Pennsylvania, was the first to accurately describe the mechanism and treatment of this form of presentation.

When we compare the mechanism of vertex and face presentation, apparently it will seem that there is no difference, but in reality a great difference exists. In vertex we have the body of the child completely flexed, the chin well thrown on the chest and the head, consequently, in the most desirable position to enter the superior strait; the full force of the contractions is received through the spinal column of the child in practically a direct line to the flexed vertex, the head reaching the floor of the pelvis, the necessary resisting force is encountered, and rotation takes place, the head passing under the arch of the pubis. Face presentations are much more difficult and much more dangerous presentations. In face presentation we have a state of extension, the chin leaving the chest and the head thrown back on the posterior plane of the child; the parturient or propelling forces, instead of passing through the spinal column of the child in a direct line, pass at a right angle; what is the result? The face instead of advancing steadily like in a vertex presentation, advances slowly and uncertainly, descends only as far as the length of the child's neck, one and a half inches, and to advance any farther, it must do so by dragging down the trunk aided by the misapplied parturient forces, increase extension to its utmost limit, we have a jamming of the presenting part, should the chin rotate anteriorly labor may eventually take place. If the chin remain presenting posteriorly, the completion of labor becomes impossible.

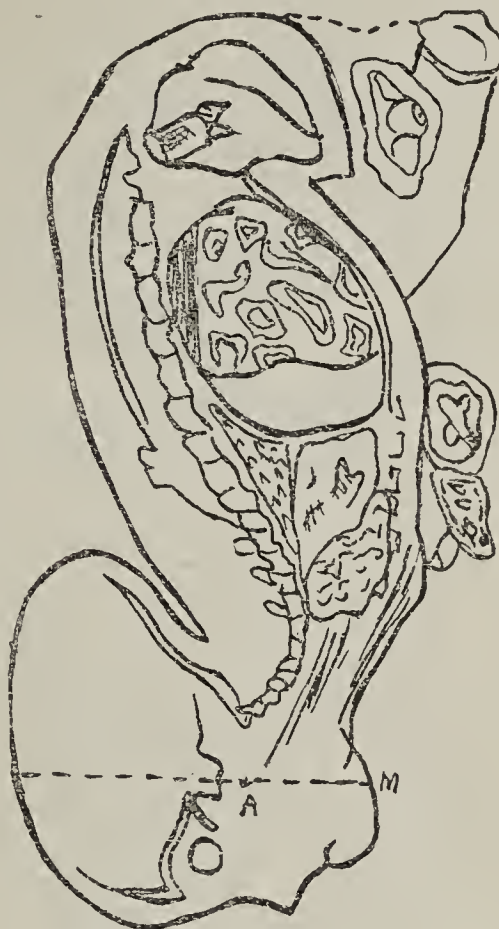


O B—Occipito bregmatic diam., $3\frac{1}{2}$ in. T B—Trachelo bregmatic diam., $3\frac{1}{2}$ in. D S—Dorso-sternal diam., 3 in. O D—Occipito bregmatic diam., $3\frac{1}{2}$ in., $6\frac{1}{2}$ in.

All things equal, that is, where there exists a normal relation of diameters of the pelvis and head, my experience has been that if the chin presents posteriorly (either to the right or left) at the commencement of labor and engages

in the superior strait as such, unless changed by manual interference, there remains a posterior position throughout labor.

It will be remembered that the parturient forces are sent through the spinal column in a broken line, at right angle. If, as the picture below will show, the driving force is met by the unequal resistance of the two arms of the face lever. A. F., being the long lever or arm, offers more resistance than A. M., the short lever or arm, the result is, the chin descends and the forehead ascends.



Attitude of the head in face presentation. (Ribémont.)

When the chin is in this position, the neck is put on its extreme tension, the extension increased to its utmost limit, it is compelled to sweep down the sacrum and coccyx, a distance of fully five inches, over the length of the perineum, which is about three inches, making in all a distance to be traversed by the chin, of eight, if not more inches, the child's neck is only one and a half inches in length, therefore before the chin can slide down the sacrum and off the anterior edge of the distended perineum, the child's thorax must be pulled and jammed down into the cavity along with the presenting face. If we study Picture No. 1, it will be seen that we have here presented, the occipito-bregmatic diameter, which is $3\frac{1}{2}$ inches, with the dorso-sternal diameter of 3 inches, making together $6\frac{1}{2}$ inches, to go through a diameter of 4 to the utmost $4\frac{1}{2}$ inches, a radical impossibility.

In anterior face presentation, the chin, by passing under the arch of the pubis, the entire

head can be born before any part of the thorax of the child begins to enter the cavity, but no such act occurs in a posterior face; here the forehead appears first under the arch of the pubis, not acting as a pivot but firmly jammed against it. The first to escape is the chin, then the mouth, nose and eyes, top of the forehead, crown, and at last the vertex, as it will be seen, a mechanism diametrically opposed to an anterior-mento-position.



Anterior face presentation.



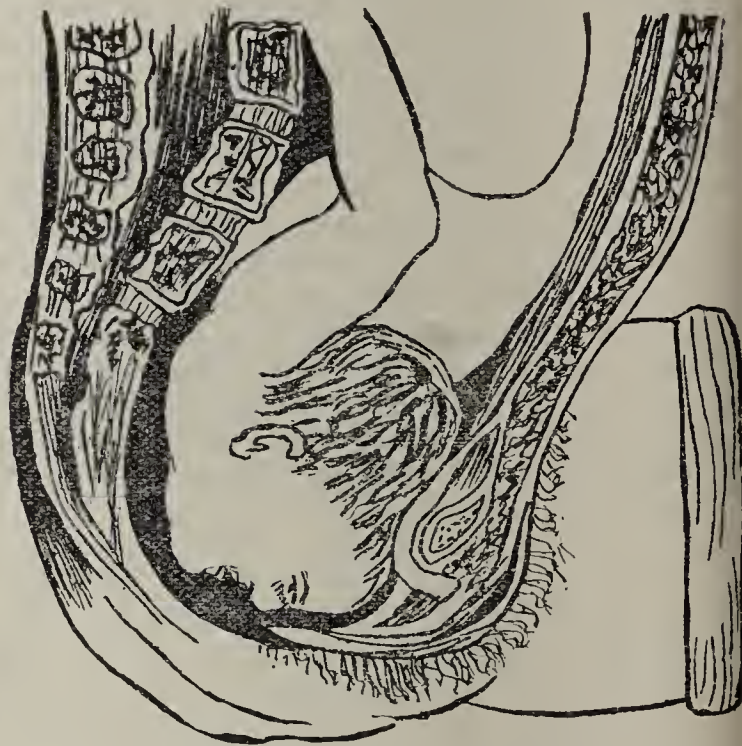
Posterior face presentation.

The treatment of mento-posterior positions practically resolves itself into two methods, version and craniotomy.

Several other methods have been suggested, prominent among which is Schatz's method. It is supposed to do away with the introduction of the hands or instruments in the maternal parts. It consists in restoring the normal attitude of the child's body by flexing the trunk and leaving the head to resume spontaneously its proper position as it sinks into the pelvis. The shoulder and breast are seized by the hand and pressed backward, at the same time the breech is raised with the disengaged hand applied near the fundus, making the long axis of the child conform to that of the uterus; then, finally, press the breech directly downward. As the child is raised, the occiput is allowed to descend, then as the body is bent forward, flexion of the head occurs by the

resistance of the side walls of the pelvis. This method is fraught with the danger of the head flexion only partially occurring, leaving a brow presentation in its stead.

In regard to the use of the vectis, I have invariably failed to obtain any good results. Prof. R. A. F. Penrose,² who strongly advocates its use in mento-anterior positions, says: "In mento-anterior position the treatment I have described (vectis or blade of forceps to be applied to the posterior cheek of the child, rotation allowed to occur of itself, not forced) should be resorted too. If, however, the chin be turned to the posterior part of the pelvis (mento-posterior position), we have one of the gravest cases in obstetric surgery to deal with. Anterior rotation of the chin under these circumstances is possible, but so exceedingly improbable, that we have no right to expect it and we should, as soon as the difficulty is recognized, treat the case as one of impossible labor."



Posterior face presentation. (Hodge.)

As to the forceps, they should never be applied when the chin is to the sacrum, it is invariably followed by serious injuries to the mother without due compensation.

While I consider version as the main treatment in this class of presentation, a treatment which rebounds to the benefit of the mother and child, I would urge the greatest discrimination. It should only be performed before the presenting face has passed out of the mouth of the uterus; after the face has entered the pelvis all attempts at version I consider unjustifiable, for version performed under the circumstances has been known to cause laceration of the uterus and other injuries to the maternal passages. Should all attempts fail to produce a favorable change in the presenting face, craniotomy should be performed, not after hours of ineffectual labor, when the mother's

tissues are sodden and their vitality destroyed by the continuous pressure of an impacted face, she herself thoroughly exhausted, but should be done at once. The child's viability is destroyed, though alive, is practically dead, and it devolves upon us to deliver the unfortunate woman as safely and quickly as possible.

The two following cases are taken from my note book: January, 1872, I was requested by a brother physician, (who had broken his forceps in attempting to deliver a patient) to bring my craniotomy instruments. On my arrival I found the patient had been in labor since the previous Wednesday; the day of my call was Saturday. She had been at first in the care of a mid-wife, who had allowed the patient to remain in labor from Wednesday to Saturday; the family, seeing no termination, in spite of the repeated assurance of the mid-wife that everything was all right, insisted upon a physician being called. The physician, having diagnosed a posterior position of the chin, attempted to deliver with the forceps, which resulted in a broken pair of instruments. On examination, I found the chin just engaging in the superior strait, free from the mouth of the uterus, presenting in the left oblique diameter, posteriorly. I attempted to force an anterior rotation, the woman's pains being good, I held the face in the anterior-mento for fully half an hour; believing the position permanent, I withdrew my hand, examination a few moments later, revealed the chin in its original posterior position. I then used one blade of the forceps as a vectis, applying it against the posterior cheek of the child, but with no results. Craniotomy was performed and the patient delivered within twenty minutes.

In August, 1885, I was called to assist a brother physician in a case. The patient had been in labor since the previous evening. Examination revealed a posterior chin presentation, not yet out of the mouth of the uterus and just about engaging. The medical attendant, prior to my arrival, had attempted to produce an anterior rotation of the chin without avail. By the time I arrived at the bedside, the patient was exhausted and incessantly crying to be relieved. I determined to perform version at once; ether was administered and within ten minutes a living child was born. Mother and child did well.

It will be seen that in neither case had the chin or presenting part entered the cavity—that has been my experience. Mento-posterior presentations of the chin do not enter deeply into the pelvic cavity, on account of presenting at the superior strait larger diameters than could pass through any of the diameters of the strait.

221 S. 17th St., Philadelphia.

MINOR UTERINE SURGERY.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 1891.

BY J. M. BALDY, M.D.,

PROFESSOR OF GYNECOLOGY IN THE PHILADELPHIA POLYCLINIC AND COLLEGE FOR GRADUATES IN MEDICINE.

In these days of major uterine and pelvic surgery, the minor operations on the uterus, of which we used to hear so much, have been in great measure lost sight of by students of the diseases of women. In consequence of this very fact of being overshadowed by newer and more alluring procedures, fortunately many of the abuses of the old days have disappeared from the practice of those working in gynecology in our large medical centers. Unfortunately this is not equally true of the vast majority of practitioners either in the cities or in the rural districts; the old teachings and the old books still manifest too much influence. The time has come when we should carefully look back over our work of the past few years and see what lessons it has taught us.

The one great fact which stands staring us in the face in this connection, is that most of the troubles which we have been in the habit of considering as situated in the uterus, are not in that organ at all. Thus with one sweep we are able to dispose of a large proportion of the so-called uterine diseases. It is then manifestly improper and dangerous to direct treatment to the uterus, when that organ is perfectly healthy and the trouble is situated in the neighboring tissues—most probably of an inflammatory nature. In a large proportion of the remaining so-called uterine diseases the womb itself is undoubtedly affected, but the lesion in the uterus is only secondary to a lesion in the uterine appendages, or if it was the seat of the primary disease, its continuance is surely due to the inflammatory condition of the contiguous organs. Here again, a treatment directed against the uterus itself is both irrational and dangerous. This leaves us but a comparatively small number of cases of pure uterine disease; such is the true situation. Uterine disease, such as metritis, endometritis, pathological displacements, etc., uncomplicated by other and more serious troubles, is the exception rather than the rule, and in a large dispensary practice during the past few years the small number of such cases which have come under observation, has been a matter of surprise to me.

It would seem, then, that the old methods proposed for the treatment of uterine diseases were not in themselves necessarily faulty, although most of them have undoubtedly been carried to excess, but that the trouble lay in faulty diagnosis and consequent application of methods of treatment unsuitable for the true disease. If the true lesion be overlooked and many of the

² Penrose on Face Presentations.

minor operations be performed, the result is sure to be disastrous in a certain proportion of cases. How often an acute pelvic inflammation will be lit up, will depend, in great part, on how carefully the given manipulation is carried out.

All this being true, there still remain a certain proportion of diseases, which are uterine pure and simple. The fact, that in the past so many mistakes in diagnosis have been made, and that disastrous results have followed the application of certain treatments, should not blind us to the value of these same methods in cases in which they are properly applicable; and yet at the same time a proper limit should be put to their use.

The Uterine Sound.—On the whole it had been better for womankind had this instrument never been invented. For the application of the electric current it has its uses, and in an occasional case where one is uncertain as to the connection of the uterus with a given tumor, it may possibly give some definite information. For the purpose of measuring the depth of the uterine cavity or for locating the position of the fundus, as it is generally used, it is absolutely superfluous; any one who is forced to use it for these purposes, excepting in rarely exceptional cases, must confess to himself his lack of even an ordinary amount of manual dexterity. For replacing a displaced womb it is a dangerous instrument and its use is very painful. A movable uterus can be invariably replaced by bi-manual manipulation, with the patient on the back, or in the knee chest position, with the aid of a tenaculum and a repositor. If the organ is adherent it no longer comes under the head of simple uterine disease and should then be dealt with by other and safer procedures. The instrument may be used with perfect safety in careful hands, but as ordinarily employed it is capable of causing considerable traumatism and of carrying septic material into the uterine cavity.

Dilatation.—This operation is one which has been much abused. It is capable of much good or much harm, depending upon whether it is used carefully and in suitable cases, or not. Personally, I have never had any permanent bad results follow its use. On the contrary, I have seen severe dysmenorrhœa relieved and even permanently cured; in not a small proportion of cases have I observed pregnancy follow dilatation. Patients have come to me suffering from a pelvic inflammation following a dilatation, performed by others, but everything pointed to the fact that the pelvic disease had existed first and that the operation had been performed, probably under a mistaken diagnosis, for the relief of symptoms produced by the diseased appendages. In but one case have I had an inflammatory attack follow this operation when there was no complicating disease. In that case I made an incomplete dilatation without ether, upon the dis-

pensary table, in a young woman, married for five years and sterile. The inflammatory attack cleared up within a week, she soon conceived and a month ago I delivered her safely of a large, healthy baby. She made a perfect and uncomplicated recovery. I should be exceedingly loath to discard the dilators from my armamentarium, and can only attribute serious accidents following their use, to a wrong diagnosis or a faulty use of the instrument.

Intra-Uterine Medication.—There is undoubtedly a limited field for the application of drugs to the uterine cavity. It should not be forgotten, however, that it is often only supplementary to other treatment. It is just as rational to expect results from local applications to the uterine mucous membrane, as from applications to the mucous membrane of the nose and throat. The fault here is much the same as in the other minor operations; either a wrong diagnosis is made, and local applications are used to the exclusion of other and probably better methods of treatment, or they have been injudiciously and rudely applied. Certainly in a chronic endometritis we may expect some good from them, especially after the application of the curette.

The Curette.—This instrument, in properly selected cases, is invaluable. In my own hands the dull curette has proven worthless and I much prefer a sharp one. Of course the instrument is capable of harm, but so is every other one used in surgery. If even ordinary precautions are taken in selecting cases and manipulating the curette, no damage will follow its application. For affections of the endometrium following labor, or of a fungoid character, it is exceedingly useful: I know of nothing which will take its place. In removal of retained clots, etc., in the puerperium the finger will be found to be more certain.

Operations on the Cervix.—The splitting up of the cervix for dysmenorrhœa and sterility has fallen into deserved disuse: all that can be accomplished in that direction, can be done with the dilators. Emmet's operation for the closure of lacerated cervix should meet much the same fate, at least in the vast majority of cases. The only excuse for the number of such operations which are being continually performed, is a fear of subsequent cancer. A simple uncomplicated cervical tear, causes no more trouble or inconvenience to the patient, than does a woman's ear which has been torn through by her earring. The ear would be repaired for cosmetic effects; the cervix is hidden from view, and that factor would not come into consideration. Most women have lacerations of the cervix of more or less degree. If the lips are thickened, everted and eroded, they will need treatment. Oftentimes simple scarification, followed by the application of iodine and glycerine tampons, will re-

duce this condition and leave a clean, healthy tear; one which will remain so until the end of time. If the lips cannot be brought into a healthy condition or if the uterus is subinvolted and the endometrium diseased, the case may resolve itself into an operative one; but even here a trial with electricity will often disappoint the surgeon. In my practice it is rare to see a lacerated cervix which calls for surgical repair. Cases which come to me from other men, who have advised an operation, get well without it. Oftentimes the symptoms, for which the operation was proposed, were found to be due not to the torn cervix at all, but to other troubles, principally constitutional.

It is the easiest thing in the world to relight a pelvic inflammation whilst repairing a cervix, and I have seen this result follow such practice only too often.

Taking it all in all, I decidedly approve of minor uterine surgery in the field to which it is applicable, but it must be borne in mind that this field is a limited one, and one which becomes more and more narrow as our diagnostic resources increase.

THE RELATION OF CONCUSSION OF THE BRAIN AND SPINAL CORD TO INFLAMMATORY AND OTHER MORBID CONDITIONS IN THESE ORGANS.

Read in the Section of Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5, 1891.

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It is certainly apparent to all the members of the medical profession that brain and spinal surgery has received during the last quarter of this century an unusual and likewise unprecedented amount of attention. It is likewise equally apparent that great progress has been made by those who are devoted to this branch of surgery; it therefore becomes highly necessary, that he, who is about to enter this field of medical literature, should first discover some dark spot or disputed question, on which he thinks he may possibly throw a few rays of scientific light. The traumatism of the brain and its membranes have been more fully studied than those of the spinal cord. Undoubtedly this may be accounted for in part by the fact, that the first mentioned organ is much more frequently the seat of these lesions than the latter. I shall therefore direct the greater portion of my attention especially to any lesions following traumatic injuries of the spinal cord and its membranes.

It seems necessary to call attention to certain

errors as a preliminary to the consideration of our first inquiry. One of the most important of these has been expressed by Mr. Erichsen in the following language:¹ "The consideration of the effects that may be produced on the spinal cord by *slight blows*, whether applied to the back or to a distant part of the body, is not altogether a matter of modern surgical study arising from the prevalence of railway accidents, but had, long antecedent to the introduction of modern means of locomotion, arrested the attention of observant practitioners." Since the above statement was made it has been clearly demonstrated to be erroneous by anatomical and experimental investigations. The anatomical studies have shown that the spinal cord is the best protected organ in the body, and experimentation has fully confirmed this position. The experiments which I made on dogs—the total number being 141—which were arranged and conducted for the especial purpose of producing concussive lesion in the spinal cord and its membranes fully convinced me that it required a *very severe blow*, which must even be delivered on certain limited areas of the body, in order to accomplish this object. I am likewise satisfied that this conclusion must necessarily follow a careful study of my report entitled "An Experimental Study of Lesions Arising from Severe Concussions."²

It should be furthermore stated that the lesions produced in the spinal cord and its membranes were rarely apparent to the unaided eye, but were readily revealed under the microscope. This statement, however, does not apply to those cases in which there were either fractures or dislocations involving the vertebræ; since the lesions here were comparatively coarse.

The statement that a rupture of the spinal membranes has occurred, or that there has been a gross hæmorrhage into the substance of the spinal cord, or between the cord and its membranes, is certainly not entitled to credence unless coupled with the acknowledgment of either a fracture or a dislocation of a vertebræ. This statement is based on my examination of the lesions found in the spinal cord, and its membranes, and I am so thoroughly convinced on this point, that I feel fully warranted in making this positive statement. The so-called "railway spine" includes true concussion arising from blows, falls, gunshot wounds, lightning strokes, electric shocks, etc., likewise contusions on the back, sudden flexions of the spinal column, sprains, wrenches, and twists. Dr. John A. Liddell says, in discussing the consecutive effects of some of these injuries, that:³ "Among the remote effects of *sprains, wrenches and twists* of the spinal column, are chronic *inflammation of the vertebral*

¹ On Concussion of the Spine. A New and Revised Edition. London: Longmans, Green & Co. 1882.

² P. Blakiston, Son & Co., Philadelphia, 1890.

joints that are implicated, which is, often suppurative in character, *destruction of the articular cartilages and the intervertebral substances* that are involved, and *caries or necrosis* of the adjoining vertebral bodies." In such cases, the destructive process begins more frequently at the junction of the vertebræ with the intervertebral substances than in the intervertebral substances or vertebræ themselves, because, as Mr. Hilton has pointed out, we know that in accidents, at least as far as we have been able to discover, "the most frequent lesion in injury to the spine is a partial severance of the vertebræ from the intervertebral substance."

A number of illustrative examples have already been presented, and inasmuch as this topic has already been pretty thoroughly discussed, no apparent need exists for presenting any additional instances of the same sort. I will, however, take space to present a very instructive case, in which there simultaneously occurred lumbo-sacral abscess and suppurative spinal meningitis, in consequence of a blow on the spinal column.

The following abstract made from the report of the history of this case supplies the essential points: A healthy lad, of 15 years, was struck by his playmate on the back with the fist. He thought little of it at the time, but was admitted to Guy's hospital nine days afterwards; was treated with leeches and somewhat recovered, but the pain soon returned and fever ensued. "An abscess formed on the right side of the sacrum, which was opened, and continued to discharge, the flow of pus being increased by pressure on the abdomen. He continued to get worse daily, having much irritative fever and severe pain in the back. During the last week of his life he was exceedingly restless, and often delirious; and he complained of pain in all parts of his body, but particularly in the extremities. On one or two occasions he had loss of power over the bladder and rectum, but had no other symptoms of paraplegia, and could move freely in bed." He died twenty-two days after the casualty.

Autopsy.—An aperture in the integuments at the right side of the sacrum led into a very extensive abscess, external to the peritoneum, which occupied the forepart of the sacrum behind the rectum, and external to the ilia on both sides behind the psoas muscles. The bones were exposed but not diseased. Although the abscess had discharged externally on the right, it was most extensive on the left. It had burrowed up to the left side of the last lumbar vertebra and the sacro-vertebral foramen into the spinal canal. When the theca was opened, it was found to contain a quantity of greenish pus, spread over its inner surface and over the cord itself. The spi-

nal dura mater (theca) at the point indicated, was softened and destroyed, and the cauda equina was lying bathed in pus which filled the sacral canal. The membranes of the cord were inflamed throughout the whole extent, and there was purulent effusion as high as the dorsal region. The spinal dura mater was thickened, and its inner surface had lost its smoothness and transparency, and was of a dull green color. Pus could be squeezed out from beneath the visceral arachnoid in considerable quantity. The spinal cord itself was firm, and the microscope revealed no morbid condition in its substance. On opening the cranium, traces of acute arachnitis were found over the whole surface of the brain, greenish-colored lymph being effused into the sub-arachnoid tissue, especially at the base. The inner surface of the dura mater, around the foramen magnum and on the adjacent part of the occipital fossa, was of a greenish color, from lymph effused upon it. Bronchial tubes filled with tenacious mucus. Lumbar and bronchial glands slightly enlarged. All other organs entirely healthy.

The purulent infiltration of the spinal meninges which was observed in this case, occurring coincidentally with the formation of a lumbo-sacral abscess, but without the production of paralysis, could scarcely have happened unless the sacro-vertebral articulation had previously been opened, both externally and internally, by disease of the articulation itself, in such a manner as to allow the products of inflammatory action to flow freely out of it, as well as into the spinal canal. Otherwise the suppurative meningitis would pretty certainly have caused paralysis by compressing the spinal cord with its inflammatory products.

The clinical history of this lad's case, interpreted by the post-mortem appearances, appears to have been as follows: The blow on the back wrenched the sacro-vertebral articulation, and caused a suppurative inflammation to be lighted up therein, particularly on the left side; and in consequence of this, purulent matter escaped in an outward direction, and led to the formation of an immense lumbo-sacral abscess; it likewise escaped in an inward direction, and caused the theca vertebralis to become softened and perforated, and extensively destroyed, and a diffuse suppurative inflammation, which extended upward to the brain, to be kindled in the spinal arachnoid.

It has been aptly said that "in all science error precedes the truth, and it is better it should be first than last."³ I have cited the case reported by Dr. Lidell, with all its details, in order that I might bring forward some of the results of my observations, made during my recent experiments, which afford a correct and rational explanation of the conditions revealed by that post-

³ International Encyclopædia of Surgery, Vol. IV, p. 870 et seq. Edited by John Ashhurst, Jr., M.D., Wm. Wood & Co., New York. 1884.

⁴ Walpole.

mortem examination. There will be found in the report of my experiments eleven cases in which there was rupture of the ligaments of the sacro-lumbar articulation. There were marked pathological changes in the organs and tissues within the pelvic and abdominal cavities in six of these cases, which were immediately connected with the rupture of the ligaments of the sacro-lumbar articulation. Let me here present the following abstracts from post-mortem examinations, for the purpose of giving a correct idea of the lesions:⁵ "Autopsy. This examination revealed a rupture of the ligaments between the last lumbar and the first sacral vertebræ, deep and extensive ecchymoses over the entire post-sacral and right lumbar regions. A profuse extravasation of blood into the abdominal cavity, marked engorgement of the kidneys. Brain apparently normal, slight increase of the cerebro-spinal fluid in the cavities, and the cord was congested, to the middle of the dorsal region."

"Autopsy.⁶ This examination revealed the following lesions: Both kidneys congested; ecchymosis in the connective tissue covering the anterior surface of the last lumbar and the upper sacral vertebræ. The brain and spinal cord apparently hyperæmic. The removal of the integument over the sacral and lumbar regions showed an ecchymotic condition of the muscles. There had been a rupture of ligaments between the last lumbar and upper sacral vertebræ."

"Autopsy.⁷ This examination revealed the following lesions: Both kidneys congested; bladder distended with urine; extensive ecchymoses in the lumbar and pelvic regions, involving psoas muscles; brain perfectly normal. The spinal cord was hyperæmic downward from the lumbar enlargement, including a portion of the caudæ equina; rupture of the ligaments between the last lumbar and the first sacral vertebræ." The essential point which Dr. Lidell has overlooked in his comments on the case which he has reported, are the pathological conditions of the organs and tissues within the pelvic and abdominal cavities. It was the *existence of these lesions which gave rise to the inflammation and suppuration* within these cavities. The post-mortem examination of Dr. Lidell's case sufficiently demonstrates this position. Dr. Lidell says:⁸ "the blow on the back wrenched the sacro-vertebral articulation, and caused a suppurative inflammation to be started up there." The autopsy in the case fails to show that there is any erosion of the bones or cartilage within this articulation, and its history reveals the fact, that it was only immediately before death that there was the slightest indication of paraplegia. It is therefore certain that the

wrench which he mentions consisted in producing a rupture of the ligaments of the sacro-lumbar articulation, and likewise, as very frequently happens in those cases, some pathological lesions within the pelvic and abdominal cavities. The simple wrenching of any joint in a healthy subject unattended with pathological lesions, has been amply shown to be a comparatively trivial injury, which does not lead to serious inflammatory complications or death.

The one hundred and forty-one experiments, which I made on animals, does not afford a *single example* which justifies the conclusion that injuries to the vertebral articulations are a whit more serious than those produced in the carpal and tarsal articulations; and, consequently, analogous reasonings may be here employed with entire propriety. We cannot pass over the history of Dr. Lidell's case without pointing out a glaring absurdity, which may possibly have had its origin in carelessness. In this report we are informed that a healthy boy, aged fifteen, "while playing with another lad, received a blow on the back with the fist," and in the absence of any additional statement bearing on this injury, we are left to infer that the pathological changes and even the death of the patient were directly caused by this blow. He who has examined the anatomical structure of the spinal column will readily perceive the absurdity of this statement. The blow *inflicted was entirely inadequate to the production of the results* which followed, unless there has been omitted from this report the most important factor in the history of this case. It is true the force of the blow might cause the lad to fall—and if at this point, the history of the case showed that the boy fell across a bar, raised a few feet from the ground, in such a manner that his feet remained on one side while his head was on the other, then the very important factor of leverage having been added, which would result under these circumstances in the production of a sudden flexion of the spinal column, would certainly bring within the limits of possibility the occurrence of the injuries which are reported in the autopsy.

It is scarcely necessary to mention the fact, that nearly all the injuries grouped together under the unfortunate cognomen of "railway spine"—so far as their remote effects are concerned—take their origin, either directly or indirectly, in inflammatory processes. Consequently the consideration of the following queries assume importance:

1. Do inflammatory and other morbid changes take their origin in traumatic injuries of the spinal cord and its membranes as frequently as the writings of Mr. Erichsen imply?

2. Do inflammatory and other morbid changes ever arise from traumatic injuries which are entirely uncomplicated by immediate symptoms?

⁵ An Experimental Study of Lesions Arising from Severe Concussions," by B. A. Watson, A.M., M.D., p. 32, Exp. 4.]

⁶ *Ib.*, p. 35, Exp. 10.

⁷ *Ib.*, page 40, Exp. 24.

⁸ Previously cited.

3 How soon are the inflammatory and other morbid changes developed after the receipt of traumatic injuries in the cord, etc.?

In our consideration of the first question it is scarcely necessary to give a negative reply to those who have perused the writings of Mr. Erichsen on this subject; since they have already reached this conclusion. Furthermore, the mere assumption that serious results frequently arise from wholly unimportant injuries *is not sustained* by clinical observations or experimental investigations. However, Mr. Erichsen, in writing of those cases in which the patient has received no blow or injury upon the head or spine, but in which the whole system has received a severe shake or shock, in consequence of which an immediate lesion, probably of a molecular character, is sustained by the spinal cord, and disease of an inflammatory character, or of a disorganizing nature, is developed in it, the inflammatory action eventually creeping up to the membranes of the brain, says that the cases "although *necessarily more frequent* in railway than other injuries, do occasionally occur as a consequence of ordinary accidents." A perusal of Mr. Erichsen's writings has completely failed to convince me that he has supplied any basis for the support of the opinion advanced in the above statement.

In order to demonstrate the correctness of this opinion, which conflicts with the positive knowledge we possess on this subject—and which cannot be supported by analogous reasoning—he should clearly establish the following facts, viz.: 1. *That no disease of the brain or spinal cord existed at the time of the occurrence of the alleged accident.* 2. *That the consecutive inflammation did arise from traumatism, and was not due in part, or wholly, to a vitiated constitution.* This evidence is entirely wanting; and, consequently, we must maintain that Mr. Erichsen's statement should be excluded in cases of medico legal evidence.

We have now devoted our attention to the consideration of the material points involved in our first query; but it would seem proper in this connection to give some additional thought to the consecutive results of concussive accidents. Mr. Erichsen says:⁹ "Whatever may be the nature of the primary change that is produced in the spinal cord by a concussion, the secondary effects are clearly of an inflammatory character, and identical with those dependent on chronic meningitis of the cord and sub acute myelitis." The term concussion, as employed in the above quotation, evidently refers only to traumatism of the spinal cord and its membranes, but elsewhere the same author in speaking of sprains, twists and wrenches of the spinal column, says,¹¹ "It is im-

portant to bear in mind that the vertebral column is more apt to suffer in these strains of the spine than in the other forms of injury that we are discussing, and that in serious cases the full force of the mischief appears to be expended in the spine itself independently of its contents, which escape uninjured." The views expressed by Mr. Herbert Page on this subject are as follows:¹² "Happily there is no doubt of the exceeding rarity of spinal meningitis as an immediate result of localized injury to the vertebral column; and I know of no case in which meningeal inflammation has been caused by injury of some part of the body remote from the spine." The experimental study of concussion of the spinal cord has satisfied me on the following points: 1. True concussion of the spinal cord from blows, falls, lightning strokes, etc., is an exceedingly rare occurrence. 2. Secondary results, such as inflammation, suppuration, etc., very seldom follow the traumatism—owing to the fact—that the punctate hæmorrhages, etc., are generally widely diffused in various parts of the spinal cord—while the pathological lesions are so slight as not to supply inflammatory foci. However, the danger arising from a true concussion of the spinal cord produced by gun-shot injuries, the lodgment of a musket or rifle ball in the spinal column, is attended with much more danger from consecutive inflammation, etc., than those traumatisms which have been previously mentioned, because of the following peculiarities: 1. The pathological lesions are more concentrated—resembling in this respect the ecchymoses arising from a concentrated contusion. 2. The lodgment of a ball in the spinal column is very liable to give rise to a septic inflammation, pus formation, diseased condition of bone, extension of the inflammatory products to the spinal membranes, and even the cord itself. It must be universally admitted that gunshot wounds, fractures and dislocations involving the spinal column, are very serious traumatisms, frequently producing death immediately, or within a few hours; even when this result does not follow, the danger is very great from the consecutive sequelæ.

Let us now take up the consideration of the second query: "Do inflammatory and other morbid changes ever arise from traumatic injuries which are entirely unaccompanied by immediate symptoms?" The conclusions reached by a careful analysis of the above question, must depend, to some extent, on the interpretation which we give to this query. The fact must be admitted that it is not only possible for a patient to receive, under certain circumstances, severe traumatic injuries, of which he remains a longer or shorter period wholly unconscious, and these occurrences are by no means very rare. I can

⁹ On Concussion of the Spine, Nervous Shock, etc., p. 95. New York: Wm. Wood & Co. 1875.

¹⁰ *Ib.*, page 157.

¹¹ *Ib.*, page 128.

¹² Railway Injuries, page 21. Philadelphia: P. Blakiston, Son & Co. 1891.

now recall a number of instances of this character occurring to officers and soldiers during the excitement of battle, while I was serving with the army. It also occasionally happens that drunkenness dulls the sensibilities in certain cases to such an extent as to render the patient oblivious to an injury which he may have received, while the same condition will more or less embarrass and sometimes even deceive the surgeon who is attempting to make an examination. These statements possess only an indirect bearing on the question under consideration. The question relates to the immediate existence of symptoms and not to the observance of the same. A critical examination of this question in the same direction indicated in the above sentences, brings us to the following query: "Are results ever produced without causes?" *i. e.*, "Do inflammatory and other morbid changes ever arise from traumatic injuries, which have failed to produce any lesions?" My experimental studies of the lesions of the cerebro spinal axis have clearly demonstrated the fact, that pathological changes are occasionally produced in this centre, some of which were even apparent to the unaided eye, while others required the aid of the microscope; but which were not followed by any symptom indicative of these lesions during the life of the animal. The question will now be naturally asked with reference to these cases: Would they not have developed inflammatory changes at a later period? I have not before me the data which would justify me in positively asserting that a result *was absolutely impossible*; but I can aver that, in all these experiments, one hundred and forty one, there is not *a single* case which warrants giving an affirmative answer. Surgical observations and analogous reasoning fully support the results obtained by our experimental research, not only with reference to the brain and spinal cord, but likewise in other organs of the body. Mr. Erichsen says in his recent work "On Concussion of the Spine:"¹³ "There is a continuous chain of broken ill health, between the time of the occurrence of the accident and the development of the more serious symptoms. It is this that enables the surgeon to connect the two in the relation of cause and effect. This is not peculiar to railway injuries, but occurs in all cases of progressive paralysis after spinal concussion." It would appear from this quotation that Mr. Erichsen fully concurs with us in the opinion, that the production of a traumatic pathological lesion is always indicated by immediate symptoms, when the degree of injury has been sufficient to entitle it to our consideration. Observation has taught us that the existence of a pathological lesion affords insufficient proof that this injury will be followed by inflam-

mation or other morbid changes. In fact, every surgeon can recall to mind cases of severe traumatic injuries of the brain in which there were extensive lacerations or contusion of this organ; but in which the secondary changes were entirely absent or very slight.

The same remark may also be made in regard to gross injuries in other parts, since the same general physiological and pathological principles prevail in the cerebro-spinal axis as in the other organs of the body. It is therefore entirely proper to introduce in connection with discussions of injuries of the cerebro spinal axis, in many cases, analogous reasoning drawn from studies and observations made in other parts of the body. It must be admitted, as a general rule in surgery, that the more extensive and the more destructive the primary traumatism, the greater will be the danger from secondary disorganizing processes. Does it not, therefore, seem absurd to attribute to a single punctate hæmorrhage, or even a half dozen of these little pathological lesions, the power of exciting a disorganizing process in *a healthy spinal cord* which may ultimately produce the death of the patient? Is there a single well authenticated case in which such a result has followed from such a cause?

Let us now proceed to the consideration of our third question, which has a very important bearing on medico-legal cases and likewise on the diagnosis and treatment of myelitis arising from syphilitic disease. Mr. Erichsen says:¹⁴ "It would appear that surgeons and writers on diseases of the nervous system have included four distinct pathological conditions under this one term, 'concussion of the spine,' viz.: 1. A jar or shake of the cord, disordering, to a greater or less degree, its functions without any lesion perceptible to the unaided eye. 2. Compression of the cord slowly produced by the extravasation of blood. 3. Compression of the cord by inflammatory exudations, serum, lymph, or pus within the spinal canal; and 4, chronic alterations of the structure of the cord itself as the result of impairment of nutrition consequent on the occurrence of one or other of the preceding pathological states, but chiefly on the third."

We have already paid our respects in full to those subjects included under the headings 1 and 2, but we have yet to deal with those embraced under headings 3 and 4.

There exists no reason to doubt that inflammation, having its origin in the spinal cord or its membranes, may be either acute or sub-acute, or that the former need be developed at an earlier day than the latter. The important question before us for our consideration, however, is how soon do traumatic inflammations arise after the receipt of the traumatism? This question can

¹³ A new and Revised Edition, page 158. London: Longmans, Green & Co., 1882.

¹⁴ On Concussion of the Spine, p. 16. London: Longmans, Green & Co., 1882.

not be definitely answered—the answer must necessarily be a mere approximation. Nevertheless, I think that observation and experimentation fully justify the statement that traumatic inflammation commonly makes its appearance within four days after the receipt of the injury. In support of the above I will here present a series of experiments, which consisted in fracturing the right leg of twenty rabbits:¹⁵ “This was done without producing a single compound fracture. The temperature details were as follows: Average temperature before the fracture, 102.6°; average temperature two hours afterwards, 102.6°; subsequent daily average temperature, first, 102.6°; second, 102.6°; third, 103.1°; fourth, 103.1°; sixth, 103°; eighth, 103.1°; tenth, 102.8°; twelfth, 103°; fifteenth, 102.8°; seventeenth, 103.2°; nineteenth, 103°; twenty-second, 103°.”

In the case of the brain and spinal cord, when there is no open wound communication with these organs, the danger of inflammatory action is greatly diminished. Furthermore, the trivial character of lesions produced by concussion, *and also the exceeding rarity of this traumatism*—except when it is produced by lightning strokes, electric shocks or gunshot wounds—all combine to impress me with grave doubts in regard to its being followed by inflammation. In fact, *there is not sufficient proof to justify the conclusion* that any case of traumatic myelitis, or meningo-myelitis, has ever had its origin from molecular disturbances or any pathological lesion which was invisible to the unaided eye in an otherwise healthy spinal cord or its membranes.

Let us now briefly examine the history of concussion, in order that we may, if possible, discover how these troublesome errors were engrafted on the profession. The history of concussion dates from 1705, when M. Littre published his famous observations. A prisoner struck his bowed head against the wall of his cell and fell dead. The inspection of the head failed to reveal a contusion, tumor or wound in the scalp, or a fracture of the skull. The cranium was opened, when it was discovered that the brain did not nearly fill the interior of the skull, while the entire brain substance seemed harder to the touch—more compact than usual. This observation has been reported hundreds of times, and it was long claimed that it demonstrated the fact that a violent shaking of the substance of the brain was capable of producing death without any appreciable lesion. Permit me here to call attention to the fact that in the report before me there is no evidence to show that there was any post-mortem examination made of any portion of the spinal column, spinal cord or its membranes, or other portion of the body, except the

head. The autopsy of the head, viewed in the light of modern science, is entirely worthless, while the position in which the head was placed at the moment the injury was inflicted suggests the possibility of a fracture or dislocation in some portion of the cervical region of the spine. It may be well to call attention to the fact that in this case, and all the other cases of concussion reported prior to the middle of the present century, the microscope was not employed to aid in the discovery of the pathological lesions. Post-mortem examinations were very rarely made even in cases of concussion of the brain, and, consequently, the case reported by M. Littre was accepted as a typical one. M. Littre, at the time he reported this case of so-called concussion of the brain, had become famous in the medical profession and therefore the following may be very properly applied to him: “Great errors seldom originate but with men of great minds.”—Petrarch. Mr. Erichsen, in writing on concussion of the spine, in 1875, remarks:¹⁶ “There is little opportunity, reason, or excuse for a post-mortem examination of that structure, which is probably the one that is least frequently examined in the dead-house, viz., the spinal cord, as it is the one the correct pathological investigation of which is attended by more difficulties than that of any other organ of the body. . . . So rare are post-mortem examinations of these cases that no instance has occurred to me in hospital or in private practice in which I could obtain one, and with one exception, I can find no record in the transactions of societies or in the periodical literature of the day of any such instance. The only case, indeed, on record with which I am acquainted, in which a post-mortem examination has been made of the spinal cord of a person who had actually died from the remote effects of concussion of the spine from a railway collision, is one that was published in the ‘Transactions of the Pathological Society,’ by Dr. Lockhart Clark. He had been in a railway collision, and without any sign of external injury, fracture, dislocation, wound, or bruise, began to manifest the usual nervous symptoms. He gradually became partially paralyzed in the lower extremities, and died three years and a half after the accident.” There is no reason to believe that this man died from even the remote effects of the traumatism. The history of this case entirely fails to connect the disease from which the patient died with the railway collision. Therefore it may be properly said of those who base an argument on this and all similar cases:

“When people once are in the wrong,
Each line they add is much too long;
Who fastest walks, but walks astray,
Is only farthest from his way.”

—Prior.

¹⁵ Amputations and their Complications, p. 525. By B. A. Watson, M.D. Philadelphia: P. Blakiston, Son & Co., 1885.

¹⁶ Concussion of the Spine, Nervous Shock, etc., p. 177 et seq. New York: Wm. Wood & Co., 1875.

TUBERCULIN, THE VALUE AND LIMITATIONS OF ITS USE IN CONSUMPTION.

Read before the Colorado State Medical Society, June 17, 1891.

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I assume that no apology is necessary for my changing the subject of this paper from the Surgical Treatment of Lung Cavities to the discussion of Koch's lymph; because of late my mind and opportunities have been turned in the latter direction. Besides, my professional brothers expect some report of my investigations of the great German scientist's new remedy, and now and here are the best time and place for it. Now, because time enough has elapsed for the expression of a great variety of opinions, and here, because no *symposium* on consumption is complete without a consideration of this recent invention for its amelioration.

The questions which to my mind need most to be answered are,

1. Was the description given us of the composition of Koch's lymph sufficient for our gaining full knowledge as to its uses?

2. Were the rules laid down by the author adequate and complete enough for the use of so powerful an agent?

3. Is the knowledge of tuberculosis sufficient, or are the means and facility of its diagnosis adequate among the average of medical men for their use of tuberculin, as proposed by Koch, without a considerable chance of damaging the patients, as much as they would benefit them?

I have arranged these questions purposely that I might answer them as I do, with a decided No. It must then follow that this is not yet a remedy to be indiscriminately sold by druggists, and generally used by all sorts of doctors.

The much to be desired time will come, if this remedy is not too soon consigned to oblivion, as it was at first placed on the top of the Mountain of Hope, that the knowledge of tuberculin and of tuberculosis likewise, will be adequate to satisfy a critical mind. But that time is not yet.

Nevertheless, with all these doubts and suggested limitations, the use of tuberculin, though unconsciously faulty, is not to be forbidden, if we can show that we are running only a ten to twenty per cent. chance of danger for the purpose of a thirty to sixty per cent. chance of benefit. The reason for this discussion is thus apparent, that through the process of exclusion, conditions only favorable to the use of tuberculin may obtain, and the percentage of danger be reduced to the minimum.

This criticism of the German professor's methods must not be considered as an under-valuation of that scientist's true worth. Robert Koch stands to-day without a living peer in the great

and growing profession of medicine, for he has originated more for scientific advance than any two men living. He has not only discovered the bacillus of tubercle so that physicians all over the world could easily demonstrate it as an essential feature in every tuberculosis, but in a few years thereafter he has produced a fluid which wars against the *habitat* of that germ, thus tending to eliminate its consequent disease. When we reflect that tuberculosis exterminates more of the human race than any other disease under the sun—that is, ever since Jenner's vaccine virus "knocked out" small-pox,—we say all honor to Robert Koch, the greatest physician of the age.

We would, if possible, find out the inadequacies or mistakes in Prof. Koch's procedure, that the perfection of his great discovery might be brought nearer to hand. For I believe that rightly directed criticism will do much to clear away the doubt and prejudice which largely pervades the professional mind as to this means of cure.

Let me then consider the questions previously propounded, and see why they should be answered in the negative. I will use the cases I have experimented on for purposes of corroboration or reference, and try not to burden your minds or patience too much with their many details. We shall confine our attention wholly to pulmonary cases. These cases have been twenty in number. Numbers one to five of these most people would call cured. I do not yet claim that term as applicable, yet they are probably better off than in a state of arrest, because the tuberculosis has been in a process of elimination. These twenty cases were serious enough; distinctly tubercular, yet only two of them acutely so.

Nos. 1, 2 and 3 were third stage cases, with both lungs more or less affected, while Nos. 2 and 3 had the dreaded laryngeal complication.

No. 4 is interesting, as showing the diagnostic power of tuberculin. This was a case of fibrosis chiefly, evidently tubercular when he came to Colorado for his health three years previous. In March, 1891, his disease was apparently fully arrested, through the fibroid process and rarefied air. The question then arose, could he go back East to live? I obtained from his parents permission to use the tuberculin to learn if latent tuberculosis remained. I was much surprised to find a considerable local reaction in the right infra-scapular space, where previous to the first injection I had not noticed anything abnormal. This reaction was over an area two by three or more inches, and was accompanied by the characteristic febrile rise to 101° , and the appearance of bacilli in his sputum, (four to the field) which had not been found by a previous microscopic examination. This reaction, which was marked after 2, 4 and 6 mgs., wore off with the lessening of fever as larger doses were reached. Finally there was no reaction after 20 mgs., and I con-

sented to his return to Massachusetts after a 30 mg. dose and about six weeks treatment. The characteristic rough breathing in the rear base of the right lung had moderated, assuming the slightly bronchial character usual in high altitudes in an arrested fibroid lung.

Case 5, of my list, is to me very interesting, because it shows the undoubted agency of climate and lung ventilation in the cure, as well as the rapidity and ease with which his system took the tuberculin. Mr. F. T. P., age 27, a lawyer from Toledo, Ohio. In January, 1890, had had la grippe, followed by weakness, night sweats, cough and loss of 15 pounds in weight. In March went to Asheville, N. C. Was thin and had decided P. M. hectic there for some time. Began to gain flesh in October. Arrived in Colorado October 18th, weight at least in summer 133 pounds. October 20, 150 pounds. Temperature ranged between 98° morning and 100° evening. Spirometrical record 240. Manometer 85 M.M. Expansion 33 and 36. Sputum yellow, one-half cup chiefly mornings. Depression, moist râles on coughing, and almost "cracked metal" on stethoscopic percussion below right clavicle. Waivey and broncho. Versicular respiration in left infra-mammary and lower axillary. All showing softening (2d stage) at right apex and arrested fibroid process at base of left lung.

May 7, after spending the winter, much out of doors, in Colorado Springs, all the physical signs were found to be improved. Expectoration less one-third cup in 24 hours. Expansion increased 1 inch, 32½ and 36½. Fewer râles at right apex. Bacilli in sputum, some slight, probably compensative, emphysema in lower half right lung.

May 15, began tuberculin injections. Bacilli five to field, no general reactions (*i. e.*, no fever), but slight local reactions shown by physical signs, so a rapid increase of dose was allowable, *i. e.*, nearly doubling every other day.

May 23, after 10 mg., thirty bacilli to field.

June 2, after 45 mg., three or four scattered bacilli to the field, but still with slight remaining indications of the effect of the tuberculin local reaction, the characteristic harsh breathing in right infra-clavicular and left infra-scapular regions. Pulse, respiration and temperature normal, expansion 32½ and 37 inches. He declared he was well, and was bound to go home, to Toledo. I could not restrain him, and so with a parting 50 mg. "shot," let him go, with the advice that he return, work up to 80 mg., and then thoroughly establish his cure by camping in the mountains during the hot months of the summer. We shall see. A letter just received from him says he does not feel as well down in Ohio, and he may return. These five cases have all lost the usual signs of tubercular state, have increased in vigor and no longer react to large doses of tuberculin, 30 to 50 mg. Their sputum,

diminished to the minimum in quantity, shows only the remnant of the vanquished bacillary army which was making war on the organism, at the commencement of this treatment, four months ago.

Numbers 6, 7, and 8 are now under treatment, and will soon arrive at the favorable state of those previously mentioned. They are progressing evenly and finely. These are, No. 6 a lady from Greeley, with broncho-fibro-tuberculosis, having a very small softened or bronchiectic spot in each lung, now completing a mid-way rest in the treatment at 30 mg. (Since reached 60 mg.)

No. 7, a tolerated third stage fibro-tubercular case, with large cavity in left apex, who has slowly reached 7 mg.; and No. 8, a more decidedly tubercular fibroid case, both lungs affected, with a bronchiectasis in the left and a softened spot on the right, and considerable dissemination of the fibroid process. He is now getting used to 1 and 2 mg. One mg. tuberculin was too much for this patient at first, and four lesser doses had to be given before the reaction satisfied me as sufficiently mild. Nos. 9 and 10, lately commenced a cautious or tentative plan of treatment, and are third stage cases progressing satisfactorily, but the final result is not yet in sight. No. 9 is a case of laryngeal phthisis, and a process of healing can already be noticed in a tubercular ulceration on the left side of the pharynx.

Nos. 11 to 14 inclusive have ceased treatment temporarily for reasons given. They were favorable cases, however, and reached an average of 10 mg. for last treatment. These four were all third stage cases, the evidence of that advance being very positive with large cavity in one case, much less positive, and in a small space in the others. I cannot consistently, with my notions of truth, classify the consumptives we have to deal with in Colorado and put many in the second stage. If softening has occurred that is usually the end of it, and it is the result in the third stage with which we have to deal.

Of these four, Dr. —, of Idaho Springs, reached 14 mg. and reacted slightly at that increase; lost his fever, and gained in strength and physical signs. The effect of the tuberculin in shrinking of affected lung tissue was manifest in his case. The highest reaction was 102° F. after 4 mg. March 8, after he returned home to his practice, he continued every other day 8 to 10 mg. injections himself. March 26, he wrote that his temperature had been above normal but one day, and that was due to extraneous causes and not to injections. He says he took the injections regularly "without experiencing the slightest reaction or discomfort. So far as symptoms go I feel as well as I ever did. Think my cough is about the same, but expectoration less. Am sure the expectoration has lost much of its puru-

lent character. Am still taking the tuberculin On the whole I feel that I am deriving benefit from the treatment, and would like to continue with increased dose if you see fit."

Case 12.—N. J. F., a laborer, aged 30. Case of tremendous cavity in left lung (see chart), reaching from clavicle to opposite left nipple, and lying on the anterior border of the lung. The regularity of his pulse 88, respiration 32, temperature 98° to $100\frac{1}{5}^{\circ}$, and my confidence in his unexcitable, steady temperament, led me to give way to his determination to try the new "lymph" treatment. I was from March 13 to April 9 reaching 9 mg., and on April 26, reached the highest point, 18 mg., when a rest of ten days was taken. Then I returned to 10 mg. at a dose, and was cautiously increasing from that point with favorable effect, when he was offered an opportunity to take charge of a squad of men working on a railroad. I believed that climate, outdoor occupation and time were as important for him as the remaining chance of benefit from tuberculin injection, and so readily consented to the change. His was, however, an interesting and exceptional case in more than one particular. His principal reaction came after the 6 mg. dose, when my attention was attracted to the characteristic rough respiration in the region of the *right* nipple, where before no abnormal sound was heard. This I have come to consider as symptomatic of the working of tuberculin in affected tissue, and is an additional diagnostic evidence which physical diagnosis alone cannot impart. Another interesting feature of this case was the seeming contraction, as the treatment progressed, of the large cavity in the left lung, due to the shrinkage of the surrounding, and probably tubercular, affected tissues. My note of the fourth recorded examination, April 23, reads, "The case has gotten along very evenly, and a marked absence of tubercular change is manifest in an even average of pulse 94, respiration 26, and temperature $98\frac{1}{2}^{\circ}$. The cavity is, if anything, less in size, and moved upward and toward the front. The lung, while somewhat inactive below and behind, shows only a few coarse râles. This closing up tendency of the lymph when acting between lung tissue and the main bronchus, is particularly applicable to the next case, No. 13, Rev. J. T. S., age 37, who had, he says, a contracted left lung, even in childhood, hæmorrhage 7 years ago, pleurisy, 6 years ago, and la grippe, winter 1889-1890.

My diagnosis of his case, April 1, when I first saw him, was fibroid phthisis, probably third stage, left (because of a small honey-combed spot under left clavicle), and first stage right. I have no doubt the poor ventilation marked on his chart at the second examination, April 6, over the lower half of the left lung, the air moving therein only a little except by forced breath-

ing, was in no small degree due to the exaggerated reactions from the tuberculin injections which were manifest around the root of the left lung. I can conceive of tuberculin having this effect in a lung elsewhere unaffected, except around the largest bronchi. The previously contracted condition of this left lung in question aggravated the effect; and headache and chilly feelings were added to the usual evidences of a decided reaction, even to as little as 3 or 4 mg. I deemed it better, therefore, that measures should be inaugurated, chiefly left arm exercise, riding horseback, etc., which would tend to improve the use of this left lung, before proceeding farther with the Koch treatment.

No. 14 of the series, the wife of a prominent Chicago real estate owner, was also of special interest, but for reasons I have not seen noted by any other observer. The highest point reached in fifteen tuberculin injections was 9 mg., yet all decided reactions were accompanied by such temporary depression of spirits, with a chilliness, the second day afterward (she took them every three days), that a cessation was deemed advisable. She said at one time while reaction was going on, she cried four hours, she felt "so blue," yet the appetite was increased, as was the ability to exercise, and the local effects were not at all unfavorable. Curiously enough her feeling of depression of spirits while on board ship at sea had been just the same.

The other six cases need also to have each a separate reference, in order to understand why eventually each should be classified under the doubtful cases for completing the tuberculin treatment. Every serious case has some prominent feature about it which distinguishes that particular one from a thousand others.

Case 15, age 36, brick mason from Massachusetts; came with extension fibroid process in left lung, probably caused by or following tubercular softening. This process increased and was made permanent, at different times after arrival in Colorado, by typhoid fever, pneumonia and by pleurisy. The strength of the fibroid tissue was shown by his pressure record on the manometer to be the normal for a man in health, 100 mm., while his spirometrical record was only 112 cubic inches, less than one-half of what it should be for a healthy man of his height. Nervous temperament, no fever, but bacilli in sputum. By the rule I will lay down the ratio of movement of the affected as compared with the unaffected side, namely, 1 to 3, with so small a spirometrical record, makes him an unfavorable case for tuberculin treatment. His case is in arrest. Nature and high altitude climate have already accomplished what tuberculin might perhaps have done. They work together on somewhat the same lines. Of course reactions, both local and general, followed, up to the limit of 6 mg., which

was reached in his case. He, undoubtedly, had fibroid tissue enough and the course was not satisfactory. He has since been doing first rate on mercurial inunctions over the hardened lung, while camping out at about 7,000 feet elevation in the mountains.

Case 16, a young man, age 20, from Scotland, a sub-acute case, diagnosed fibro-tuberculous, second stage, right, and first left. I believe the tuberculin treatment could not compass this case, for the principal reason which operates in many other serious cases, lack of ventilation of the chiefly affected lung, and also, in this case, because of a concealed septic state. Though 14 mg. were very gradually reached in the course of six weeks with some improvement, yet some times even a greater afternoon rise of temperature would be shown, 102.3° , when the tuberculin had not been given than when it had. The abandonment of tuberculin and the substitution of iodine and chloride of gold and sodium injections for three weeks, greatly controlled the fever, and he is now doing fairly well.

Case 17 I think was peculiar from the too great amount of elastic tissue in his expectoration, which followed a diminution in amount of sputum from 1 pint to 4 ounces per diem, during the first two weeks of tuberculin treatment. He was a blacksmith, age 35, from Omaha, Neb. His was diagnosed as a case of broncho-fibrosis, both lungs affected. Second stage right, and first, with large bronchiectasis left.

This case prompted the suggestion that it is possible excessively to stimulate the production of fibrous or elastic tissue, which is, of course, inadvisable in those already having enough. So although bacilli in decreasing numbers were still found in his sputa tuberculin was discontinued at 12 mg.

Case 18, age 30, Secretary of a Cattle Company in Canon City, originally from Kansas for his health. A large cavity on left lung with some slight fibroid involvement of the rest of the left and part of the right lung. There was slight oozing of blood into the cavity, under one of the reactions, suggesting caution in advancing the treatment; and 12 mg. in a month was the highest point reached. In his case, other than the cavity, there was decided local improvement,—an increase and then a decrease in the number of bacilli to the field, an effect of treatment which was shown in nearly all of these cases.

Case 19.—A young man aged 24, from Kansas. Disease originally started from left pleurisy with effusion. February 17, before tuberculin treatment, the diagnosis was, left third stage, fibro-tuberculosis and catarrhal phthisis and right first fibroid. During the next four weeks 17 mg., the largest dose, was reached. The patient increasing from $128\frac{3}{4}$ to 135 pounds in weight, and being very much encouraged by his ability

to do and his general improvement. He then had an attack of what seemed to be la grippe, and no more injections were given. A week after this he was taken down with a very bad attack of measles. After ten days these accumulated poisons seemed to have centered in his left lung, which broke down rapidly, and he died one month after these tuberculin injections. I do not regret the course taken in this or any of the cases to whom tuberculin was administered, for accidents like that last mentioned could not be foretold, and the only disparaging claim that could be made would be that this young man was perhaps less liable to stand the peculiar poison of measles than if he had not been under the Koch treatment. Some of these patients are present for you to see them, and my charts and records of these reported cases are here for your attention if you desire it.

Case 20, much like No. 16, only worse as to febrile change and impossibility of thoroughly ventilating a contracted and partly honey-combed left lung. The pneumatic cabinet might have been of use in this case in counteracting the shrinkage effect of tuberculin in upper half of the affected left lung. This, as before explained, shuts in the stagnant air and perhaps the exuded bacilli in the lung below; and such a case is not a good one for pushing the treatment.

These are the only cases to whom I have administered tuberculin, except two cases this week commenced, and a small dose of $\frac{1}{4}$ mg., given to a forlorn case for diagnostic purposes only. It was desired to know if the only remaining lung (the left) was tuberculous, and this experiment by local reaction verified the suspicion that it was. The Shurly treatment was then pushed with some good effect, but the patient died a month or two later.

On the whole, considering the very serious nature of the lung conditions in these, all of them tuberculous cases, the result of the treatment is very encouraging, as proving tuberculin to be an important aid to climatic treatment in this region; or *vice versa* if you prefer it that way.

I ought perhaps to say that during this time, covered by my tuberculin experiments, I refused or decided not to give the Koch treatment to more than twice as many patients, partly because they were unsuited, but in a majority because they were incipient cases, especially suited to our climatic treatment.

We have been asked or have ourselves desired, to use this newly discovered agent—tuberculin—without any very distinct understanding being granted us as to its composition, its strength or its mode of preparation. In view of reported adverse experiences and statements in reference to its use, this enforced uncertainty as to detail naturally suggests the inquiry: would it not have been better to have submitted the first use of tu-

berculin, with all available information with reference thereto, to carefully selected experimenters for their separate determination of rules of procedure, and then from these sources reliable directions as to detail could have been sent out to the world. As it is, we now hear of Prof. Koch reducing his initial dose in certain cases to one-tenth of his first promulgated order.

The advisability of the method employed for putting the tuberculin into use, was questionable, that is, its only being sold to hospitals. Of course one could use the friendship of the Secretary of the Interior, as I did, and get some of the "desired stuff," as he called it when he sent it to me. Nevertheless, the arbitrary restrictions to only hospital use conjoined with the directions that patients should be put to bed when reacting to the lymph, was, I believe, a mistake. It was suggestive of the use of too large doses in too serious cases, and a lack of a right conception of what was desired to be accomplished. I started out to follow the direction with a private hospital of ten beds, but soon found it unnecessary for the kind of patients who do best under this treatment. To be out of doors, riding on tramway or cable cars, even while gently reacting, was not hurtful, and my most satisfactory Koch patients were those who regularly exercised; as No. 1, who is a furniture polisher and has kept at his work ever since the first week of treatment; No. 2, who is all the time *on the go*; No. 5 ditto, whose expansion has increased to $4\frac{1}{2}$ inches; and Nos. 8 and 9, who, though reacting to less than one mg., have been averaging five to eight miles walking daily.

As to the details of the necessary examination, preliminary to commencing treatment with tuberculin, I have not time to give all the particulars. You can see my own examination chart which I here present; but I know that ordinarily some of the most essential points are omitted by the average medical man. Take the manometer, spirometer, and mensuration, for instance. The manometer, which gives information in millimetres of mercury of the strength of new elastic tissue formation in the lungs, is very seldom used; the spirometer, which has been depreciated by some of our best authors, the late Dr. Flint, Sr., for instance, is not one-tenth appreciated by the medical profession; I do not know that the bilateral movements of the chest are generally taken, and the same can be said of proper stethoscopic percussion for determining the commencement of softening or excavation of lung tissue. As I have made a careful use of these extra aids, to a proper understanding of these tubercular cases, I may perhaps be excused for referring to some thoughts which seem to me essential.

PRECAUTIONARY MEASURES AND RULES:

Understand the patient, the extent and character of his disease and its abridgement of his

respiratory capacity, or the liability to such abridgement under this treatment. For this purpose compare the chest expansion and spirometrical record with the normal for his height; and if, as is most likely, the two sides differ in movement, compare the bilateral movements with the spirometrical record of this given individual. For instance, as in case 13 of my list, the movement of the left as to the right side was as one to three, and the spirometrical record 150 cubic inches, when it ought to be 250 for a healthy man of his height. Well, if we were to calculate that the right lung does its full share it would leave only 125 cubic inches for the left, or on the basis of one to three of what was breathed, 37 cubic inches should be allotted to the left lung, and this only on forced breathing to the extreme. Of course this left lung was not ventilated. If there has ever been any softening in such a case and it has reached such a stationary stage, as the fever curve, that tuberculin would be otherwise safe to administer, then it must be that nature has been already at work through her own method of cure—the fibroid process. She has probably pasted up the lung by her plastic exudations of fibroid deposits, even to adhesions of that lung to the chest wall, so that the bacilli, though numbered by the million, lie embedded in natural prison vaults, almost effectually shut off from again invading the rest of the system.

Among the records of arrested phthisis in this rarefied atmosphere, we Colorado physicians have all seen this natural arrest. In fact, this fibroid process is so evidently Nature's chief reliance in all successful, as well as all fatal cases, that we are led to ask—how can arrest after softening of lung tissue occur without the aid of this natural method? Why, then, since the character of auscultation sounds, and the method of healing caused by mild reactions to tuberculin are so similar to the effects of the fibroid process, only more accurate, why, I ask, should we go outside of natural causes to explain the curative process of Koch's lymph? It is entirely unnecessary. The lack of understanding of this matter is so queerly shown even by men of high repute.

Dr. Bristowe, who opened the late discussion of Koch's method in the Metropolitan Counties Branch of the British Medical Association, scouted at the idea that the bacilli were not killed but simply imprisoned "in an excess of inflammatory products," and Dr. Hector Mackenzie, equally antagonistic in his remarks, claimed that "Koch had led us to suppose that he had himself fully tested this wonderful remedy of his, that he had found that it prevented the growth of the bacilli in the test tube," etc. Dr. S. K. Jackson, of Norfolk, Va., in his late article on Tuberculin, read before the Section of Practice at the May meeting of the A. M. A., in Washing-

ton, entered into a lengthy argument to show that the bacilli *in situ* are killed by the introduced ptomaines of artificially cultivated bacilli, in accordance with a law which he had some time ago and several times since announced that "no organism can live in its own excreta." The test tube has nothing to do with a natural process like that we are discussing, and as for "poisoning" the bacilli in possession of the battle ground in the lungs, by their ptomaines introduced into the blood hypodermically, I am myself inclined to believe it would be disastrous to the human body, or to any other body, to do such a thing. It does not seem reasonable to me that enough of the ptomaines diluted by the blood would reach the bacilli to poison them. Koch himself says that they are not destroyed. It is now perfectly clear to my mind that *that* is what does occur where Koch speaks of the "imprisonment of the bacilli" in inflammatory tissue, provided that *inflammation* is the proper term to use. But I am led to believe that Koch made a great mistake when he put it before the world that it was the "necrosis" (death) of the affected tissue which was effected, or ever desired to be effected. No, to kill the part, in order to destroy the enemy contained therein, would be such an aggravation, or rather perversion of the splendid healing process at the bottom of his discovery, that no one could gain an advantage from so doing, unless it would be Prof. Virchow, with his twenty-six post-mortems on bodies defunct after tuberculin treatment. The renewal and healing of given tissue affected is not to be brought about by the death (necrosis) of that tissue, which means its extinction. It is not necrosis that takes place or is desired, but a stenosis, through the substitution of new material or the quickened action of Nature's fibroid process, in answer to a local demand. If it were not for an unusual cause, which is the tuberculin in the blood, nothing out of the ordinary would happen. But that which happens is unusual. Here I am led to a confession of faith, which is sufficiently strong to support me in the further use of tuberculin in my practice, though every other physician in America should pronounce against it.

It is a beautiful idea, abundantly verified as the law of Nature in her warfare with disease, that every living tissue is endowed with a certain power of protection against injury, and repair for the same. This power is inherent in, and manifested in harmony with, the activity of the *life principle*. So an acute injury of the delicate lung tissue, where the circulation of blood is five times as rapid as in the capillaries of the service of the body, must result in a correspondingly greater systemic disturbance, and local demand for repair. Therefore, when an unused, poorly ventilated, catarrhally affected portion of lung becomes the congenial and fruitful abode of man's greatest

enemy—the bacilli of tubercle—I believe the call is not unheeded by this independent thought of nature. The resources of the whole system are called upon to aid in the burning out of the enemy by combustion, drowning or washing him out in the rivers of catarrh, or burying him beneath or behind the ever encroaching fibroid battlements. Where else will we find this protective influence more acute than at that point, especially in the lung, where the bacilli are lodged, and already surrounded by *these sensitive, protective elements*? It is not unreasonable to believe that the fibroid tissue which surrounds tubercular spots or ulcerations, and whose chief function and tendency is contraction, should be unusually susceptible to the ptomaines or juice of the bacilli, were these poisons to find their way there through the general circulation. I believe that this is the case, for I have several times verified the contraction of fibroid elements in affected lung tissue under the special stimulation of tuberculin.

I know I shall be deemed delinquent in this article if I do not mention the action of the Philadelphia Commission and the Johns Hopkins College Hospital, in discontinuing the use of tuberculin because they were disappointed with their results.

As to the Philadelphia physicians, whom I highly esteem, I wish to say this: They were scrupulously following Prof. Koch's directions as to *dose* and *rules of confinement*. I am not. The character of the cases chosen at both the above trials were serious enough, notwithstanding a lurking suspicion in my own mind that had they properly tried stethoscopic percussion in some of their cases, "with tubular breathing and moist crackling râles at an apex," they would have detected excavations *before the treatment* instead of referring an advance in disease to the tuberculin injections. Of course, the contraction of affected tissues around a softened spot makes a small pre-existing cavity more evident.

The Johns Hopkins College Hospital failure is not to be wondered at. They could not surely have expected to have a miracle performed; for had they started out to damn the Koch treatment they could not have done so more effectually than by selecting such a bad lot of cases, housing them in an hospital, and giving them such large doses of tuberculin. Look at the list of the first eleven cases reported. Five of them with both lungs considerably affected; seven with large cavities, and the others with softenings commenced or going on, *i. e.*, according to the physical signs noted in the first report. Had these cases been set loose in the country during the time of the Koch treatment, and reached the maximum of 4 mg. instead of 12 to 20, they would probably have had enough for their needs. I cannot see that the essential precautions men-

tioned in this paper have been taken in any of the experiments thus far reported in the journals. The nearest approach to their observance, which have furnished equally favorable results to my own, have been by Dr. Karl von Ruck, of Ashville, N. C. I was very glad to see from his late paper in the *Medical Record* that he had been working on much the same line as I had. I do not notice in his reports the extravagant general and febrile reactions so grossly exaggerated in newspaper reports of certain so called "Koch hospitals."

CONCLUSIONS.

The following conclusions, however poorly elaborated in the body of this report, seem to me to be warranted at this stage of our investigations.

1. Tuberculin furnishes a natural method of cure, to be classed with stimulants, hypophosphites, exercise, high altitudes and cold, dry air; yet it is too powerful to be indiscriminately used, and the proportion of consumptives for whom its use would be advantageous remains to be determined.

2. It is unreasonable to expect that tuberculin will be useful in sepsis, or any poisonous blood state other than tuberculosis.

3. Use tuberculin not as a substitute, but as an aid to climate, and other natural methods of cure—proper food, hygienic surroundings, mountain climbing, etc. Especially are high altitudes and exercise indicated, if otherwise advisable, because they favor the ventilation of lung tissue, which is necessary in giving tuberculin.

4. Seek only local reactions in the affected tissues. A high or prolonged febrile reaction is to be avoided, if possible. Use the minimum dose that will accomplish this purpose, and it is preferable to let at least a day elapse between a subsidence of one reaction and the possible creation of another. Remember that an increase from $\frac{1}{4}$ to $\frac{1}{3}$ of a mg. may be as great for a case already reacting to the smaller dose as an increase from 30 to 40 mg. in a case that is far advanced in the treatment.

5. The lack of ventilation in a lung, whether caused by tuberculin already used or pre-existing, is a decided contra-indication to pushing the treatment, *i. e.*, according to this deficiency and the febrile state.

6. The test for the proper ventilation of a tubercular or fibro tubercular lung is to be found in the comparison of the spirometrical record with the bilateral measurements of the chest and with available physical signs. A fair way to express deficient ventilation is to say, if the normal spirometrical record for the height is abridged one-half, and the movements of the two sides are as one to two, then there is sufficient lack of ventilation in the weaker lung for exercising extra caution as to using tuberculin at all. There is

either too much elastic tissue already there, or the bacilli, if loosened by tuberculin, may not be expelled.

7. The stage of the lung disease has not so much to do with the question of using tuberculin at all, as has its extent and locality, the febrile course and the ventilation of the affected lung. If possible, have an average daily range of temperature of less than two degrees F. upon which to proceed, and the patient able to be much of the time in the open air.

8. The diagnostic value of small hypodermics of tuberculin is shown with or without febrile reaction in the appearance on auscultation at suspected or affected spots in the lung substance, of a more or less decided *roughening of a previously existing broncho vesicular respiration*; or a *high pitched, rude breathing* where before only a feeble respiration was noticed.

9. With the appearance of any unfavorable physical signs during the course of tuberculin treatment, such as a clogged up section of lung, or scattered moist râles suspicious of softening, I think it would be well to intermit injections of tuberculin and substitute those of iodine for a while, or to give temporarily syrup hydro-iodic acid compound, or to use inunctions of olate of mercury over the affected lung, until a return to the use of tuberculin is quite safe.

10. As to permanence of effects produced by tuberculin injections, there is to me no apparent reason for expecting any more lasting results than from any other agency which will accomplish as much. I do not see any reason why bacilli should not appear again in the sputum after their cessation under tuberculin treatment, as after their cessation under climatic change or the double chloride of gold injections. It is quite probable that the effect of tuberculin is temporary. We need not look for a guaranteed immunity from lung tuberculosis except under such other conditions of healthful living as would insure it.

11. In fine, tuberculin is not a remedy to be chosen for the great majority of pulmonary consumptives in preference to a proper change of life and climate, for it does not equal the latter; but with such a change, it is an important adjuvant to the cure of a large selected class of tubercular lung diseases.

Denver, Col., June 15, 1891.

BEQUESTS TO MEDICAL CHARITIES.—By the will of the late Mr. John T. Farish, who died recently in New York, charitable bequests were made to St. Luke's Hospital, \$50,000; Home for Incurables, \$50,000; New York Cancer Hospital, \$25,000; Hospital for Ruptured and Crippled, Nursery and Child's Hospital, House of Rest for Consumptives, and Manhattan Eye and Ear Hospital, each \$10,000.

LOCATING THE BALL IN A CASE OF GUNSHOT WOUND IN THE CERVICAL REGION.

Read before the Chicago Pathological Society, June 8, 1891.

BY J. J. M. ANGEAR, B.Sc., M.A., M.D.,

PROFESSOR OF PHYSIOLOGY, NERVOUS AND MENTAL DISEASES IN THE COLLEGE OF PHYSICIANS AND SURGEONS, KEOKUK, IOWA, AND PROFESSOR OF PHYSIOLOGY AND PATHOLOGY IN THE U. S. DENTAL COLLEGE, CHICAGO, ILL.

Twenty-second day of August, 1889, I was summoned to see Mr. W., in the south-east part of Kansas, under the care of Dr. D. W. King, of Wier City, Kansas, whose history I learned as follows: Mr. W. was born in Henry County, Ill.; was 33 years old; had lived in Cherokee County, Kansas, nineteen years; married, had no children.

On the 11th day of May, with others, he was out hunting, and was accidentally shot in the neck by a glancing shot, with a 22 caliber rifle ball. The manner in which it occurred will be better understood by referring to the diagram.



The tree, C, was in a field. The line A B represents a hedge which divides the field from the road. E and F represent two men who fired at a bird on a branch of the tree, C. A ball from one of the two men's rifles E or F, struck the branch on which the bird was, and glanced and struck Mr. W., at D, a distance of 105 feet, who at the time was intently watching for game in the hedge, carrying his gun in his hands, cocked. His body was leaning forward, head still further forward, and thrown toward the right. The ball struck him a little back and inward of the point of the shoulder. He fell on his face across his gun. He experienced no pain, but could not breathe. He supposed that his gun had gone off and the rebound had struck him in his stomach, and had "knocked his breath out." It was some time before he could breathe; there was no hæmorrhage.

Dr. King could not follow the direction of the ball with the probe, because the probe could be more readily passed between the muscles. And it was impossible to put the body in the exact position that it was in when shot.

His temperature rose to $105\frac{1}{2}^{\circ}$, pulse 110 and remained so for one week, when temperature fell to $103\frac{1}{2}^{\circ}$, and the pulse to 100. The temperature remained at $103\frac{1}{2}^{\circ}$ for eight weeks, when it fell to normal and remained so for two days only.

For the first four weeks he experienced excruciating pain in his shoulders. Dr. J. D. Griffith, of Kansas City, was called May 19, 1889. He operated, with the view of removing the ball, by cutting down upon the spinal column, and found the laminae of the sixth cervical vertebra badly fractured and slightly pressing on the cord, but no hole in the lamina. He removed the spinous process of the sixth cervical vertebra with the bone forceps, and with a large trephine removed the laminae and picked out the fragments of bone. The dura mater was badly torn; he removed the torn portions with the scissors. The cord was not wounded nor contused. He did not find the ball so he closed the wound, which healed by granulation, readily. The next day severe nervous rigors set in, and spasmodic contractions of the muscles, akin to rigor mortis (tonic spasm). They continued for two weeks, in fact have never left him entirely. Drs. Agnew, Wyeth, Gregory and myself had been consulted by letter. Prognosis given was unfavorable.

I saw him August 23, 1889, three months and twelve days after the accident, and found him as follows: Mind as clear as ever, paralyzed below the neck on both sides, except the deltoids. He could lift his arms and move his little fingers slightly. His face was dark with fine red spots or points, such as we sometimes see in cases of epilepsy. Breathes well while lying down, but with difficulty when sitting up. The muscles of the back of his neck are paralyzed, and his head drops forward upon his breast; when his head is brought forward far enough so that the centre of gravity of his head falls in front of its support then he stops breathing, becomes entirely unconscious; by lifting his head and putting him on his back, so that his neck is straight, in a short time he breathes, becomes conscious. He looked around in a bewildered manner and asked, What is the matter? Where have I been? How long was it?

With ease and without pain he is able to move his head in every direction, except backward. No difficulty in moving his tongue; voice and eyes are normal, so are all of his special senses except feeling. At first he had to be cautious in swallowing else the material which he attempted to swallow would pass into the larynx. At present there is a great improvement in this regard. May say that deglutition is normal.

Rate of respiration, at first ran down in proportion, as the pulse ran up. This has improved, but the rate of respiration at present is not quite in due proportion to the pulse-rate. The pulse runs down to 40 per minute when the bladder is washed out.

The urine had to be drawn off every six hours, and would draw off from a quart to one-half gallon each time for the first eight weeks. Since

that time it has passed off of its own accord, but not unconsciously. There is a desire to urinate. He has but little control over the bladder. He can hold the urine for a very limited time, a few seconds only.

At first the bowels moved without cathartics, but not at present. He has a little better control over the rectum than over the bladder. The inferior extremities feel as if asleep, but better than they were. Not much of formication. Sensation exists all over the body, but very low, not able to recognize two prints of the æsthesiometer anywhere below the point of injury; but he can tell when and where he is touched or pricked, and says he could touch any part of his body he may be asked to, were he able to move his hands and arms.

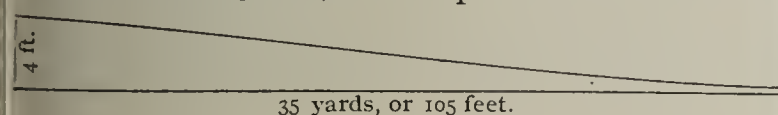
When the æsthesiometer is put across the limb, instead of recognizing the two points, he says it seems to him as if something were pressing upon or across the limb.

The heart and lungs are normal. Reflexes of the superior flexor muscles are present, but not the extensors. Did not test the knee-jerk. Could not get any ankle clonus. Tickling of the soles caused no contractions, but he said he felt it. No pain in his head except soon after the operation, and then in the occiput.

There is a sudden contraction of all the flexors of the body from the slightest irritation, as the movement of the bed clothes, or a draft of air strikes him. He will draw up his feet and legs, draw his hands up under his chin, his head forward, and bend his trunk forward; thus the body gets into a ball, as nearly as possible. No apparent atrophy of any of the muscles. Priapism just making its appearance very slightly. There is a large bed sore over the sacrum, which was started by leaving the bed-pan under him too long at one time.

The first thing is to locate the ball, if possible, then to determine a course of treatment, if anything can be done.

The branch of the tree that was struck instead of the bird, and from which the ball glanced, is about eight feet from the ground. The ground where Mr. W. was standing when shot is about eighteen inches below the foot of the tree. Hence the total elevation from which the ball came is nine and one-half feet. Mr. W. is five feet seven and one-half inches in height, and was stooping, and was shot a little above the point of his shoulder, hence the ball struck him about five feet above the ground. This height, subtracted from the total elevation, is about four feet six inches. Therefore the ball, in reaching its victim, had a descent of about four and one-half feet in 105 feet, thus represented.



Practically the elevation was nothing in comparison to the distance—a little over one-half inch (.514) in a foot.

The inclination of the body forward and the head forward and to the right, more than counter-balanced the elevation from which the ball came. Practically it was as if he were standing erect and the ball came from below and from his left and behind him, hence the ball travelled upward and forward, striking the left lamina. This surface looks backward, downward and outward, which deflected the ball a little backward and upward. The ball must be above the point where it struck the spinal column. If the ball came with sufficient force to penetrate this lamina, it is to be found above the point of entrance into the canal. The distance it will travel upward in the spinal canal will depend upon the momentum that the ball had at the time of its entrance into the canal. This we have no data by which to make any calculation.

Our mathematics, or mechanics, tell us the ball is up above the point of entrance. There was but one wound, hence we know that the ball is in the neck. Either in the spinal canal or it had fractured the lamina and lodged just outside the spinal column. If this is to be told it must be told by symptoms and not by mechanics.

The nervous center for respiration extends from the upper part of the medulla oblongata down to the third or fourth pair of cervical nerves. There being no difficulty in breathing when the head is in a normal position, hence that part of the cord was not damaged.

The spinal accessory arises as low down as the fourth pair of cervical nerves; was not interfered with in its function, because voice was normal and he was able to rotate his head.

The brachial plexes arise a part above and a part below the fifth cervical vertebra. The circumflex animates, the deltoid and the ulner goes to the little finger; both of these were less affected than any other part of the brachial plexus. He could with difficulty lift his arm and slightly move his little finger. These all tell us that the ball is as high and no higher than the fifth cervical vertebra.

We must remember that the dura mater of the cord is not attached to the spinal canal, but there is a space between the cord and the dura, as well as between the walls of the canal and the dura, therefore we are able to introduce a probe between the cord and the dura or between the dura and the walls of the canal for two or three inches with impunity; for this reason we wondered why in the operation the ball was not found, and we were told that the lamina was fractured; but there was no hole through which the ball entered the canal. We began to doubt seriously that the ball was in the spinal canal. At this vital point, symptomatology is too cloudy to aid us to

dispel the doubts. If there are any symptoms or evidence of cut, lacerated or compressed cord, they were so completely covered by the symptoms of general meningitis and myelitis that they could not be recognized.

We gave our attention to the external parts of the neck in the vicinity of the fifth vertebra. We found a very tender spot opposite the transverse process of the fifth vertebra on the left side. If this was the ball, it was playing no part in the present nervous disturbance, and not being positive that it was the ball, he refused to have an exploratory incision made, saying he had been cut enough to no purpose. We soon came to the conclusion that the meningitis and myelitis had almost destroyed the cord. Had the ball destroyed the cord there would have been priapism from the beginning; but as it is, it is but just beginning, and it is to be taken as evidence that secondary degeneration has taken place, and regeneration of nerve substance under such circumstances, is not known to occur. Muscular atrophy follows destruction of the cord and there is no evidence of atrophy at present. Spasmodic paralysis is evidence of secondary degeneration.

The high temperature which existed for the first eight weeks is evidence of meningitis, and not injury of the substance of the cord. The contractions of the flexor muscles came from the myelitis. Thus far the degeneration is of the descending variety alone. Had there been any of the ascending variety, he would have died of asphyxia before this.

We have decided that the ball is up as high as the fifth vertebra. If we operate we must remove the transverse process and laminae of the fifth vertebra. The process prominens, the spinous process and laminae of the sixth vertebra are gone, and now to remove the transverse process and laminae of the fifth vertebra, is to remove a large portion of the support to the head, and would be, at least, a mutilation which demands serious consideration, and not to be perpetrated without strong hope of bringing about such relief as to undoubtedly compensate for the great loss.

Should we cut down, find the ball and remove it, it would not remove the damage already done to the membranes and cord, nor would it put a stop to the chronic meningitis and myelitis, nor would it arrest the degeneration that is going on. It would aggravate all these pathological conditions, and simply hasten the final end.

This array of facts compelled us to abandon all thought of operating. We had an apparatus made to hold his head in position, with the hope that it might enable him to sit up, and even to be taken out of doors, and thus maintain his general health, give the bed-sore an opportunity to heal, aid the bladder in getting rid of the

urine, which is becoming ammoniacal, and thereby lessen his suffering and prolong his days. With it he was able to sit up five or six hours at a time, but could not wear it all the time, it made him "so tired."



Figure 1.

Dr. King wrote me in substance as follows: "The cystitis became very bad, though the bladder was well attended to, was washed with various antiseptic washes; the urine became so offensive that it was very sickening to wash out the bladder. The priapism became very troublesome, also the tonic spasms of all the flexors. The muscular atrophy was very great before he died."

He died September 5, 1890, one year, three months and twenty-four days after the accident. Ten days previous to his death he had been passing from his bladder a material resembling prune juice in color and consistency. Pulse full and strong, 120 per minute. Temperature 103°, respiration 20, with stertorous breathing.

Post-mortem three hours after death. A deposit had been thrown out over the cord where the lamina had been removed. The ball struck the lamina of the sixth cervical vertebra and deflected upwards, and penetrated the dura mater on the right side of the cord, at a point corresponding to the middle of the fifth cervical vertebra, where it now remains. The fourth, fifth and sixth pair of cervical nerves, for a distance of an inch from the cord, showed traces of atrophy, but the brachial plexus was normal.

The walls of the bladder were from three-fourths to an inch in thickness, and resembled the inside of a gizzard. Numerous bands of a gelatinous

substance, black and gritty, formed an artistic network over its surface. It was extremely attractive to the eye, but disagreeable to the nose.



Figure 3.

The same prune juice-like material was in the ureters and kidneys. Numerous calculi were



Figure 4.

liver was enlarged. The stomach, heart and lungs were normal. It is very evident that death was caused by uræmia. The cystitis was caused from the injury from the cord. Nephritis was set up by the inflammation of the bladder. The nephritis caused the uræmia.

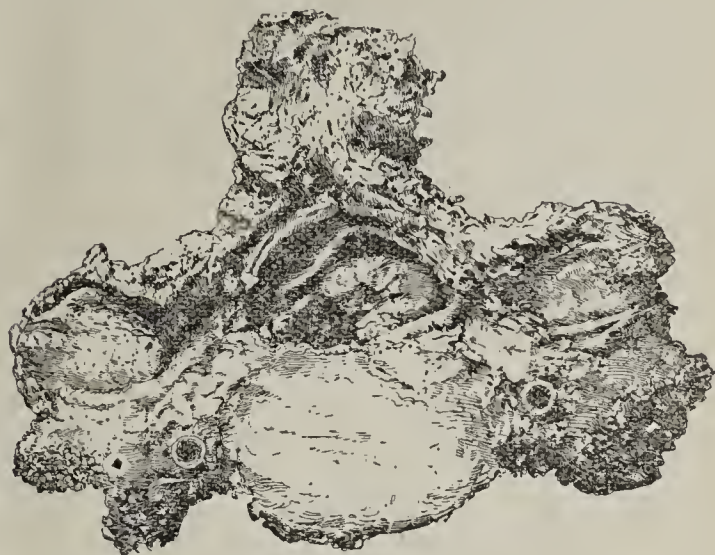


Figure 4.

Microscopic examination of the cord just below the ball: No. 1, shows the cord as a whole. All normal appearances of the cord are destroyed by the myelitis.

No. 2, a lateral portion more highly magnified, showing the hypertrophied neuroglia and blood-vessels, but it fails to bring out any motor cells or nerve tubules.

No. 3 shows the thickening of the membranes, the result of the meningitis.

Fig. 4. Fifth cervical vertebra, showing the ball between the cord and membranes.

A Case of Hermaphroditism.

Prof. Polailon has recently¹ reported an interesting case of hermaphroditism. The patient, Marie P., æt, 25, was referred to him July 1887, for the purpose of having an operation made, because of absence of the vagina. The young woman had never menstruated, nor had she had any periodical sickness, nor congestion, nor hæmorrhage of an organ taking the place of menstruation.

The external genital organs were well formed. The mons veneris, the labia majora, and labia minora were normal. The clitoris was of ordinary dimensions and appearance. Below it the meatus urinarius occupied its usual place. But behind the fossa navicularis the vagina was represented by a depression scarcely two centimeters in depth. Above this depression the most careful examination failed to reveal the slightest trace of a uterus. At the level of the external inguinal ring on each side there was a swelling resembling a bubonocoele. Each swelling contained a hard, ovoid, mobile body giving a peculiar sensation on pressure. On coughing there was only a slight propulsion of the intestine behind or beside these organs. She had never observed that these organs became more voluminous or more sensitive at certain times. In physique she had all the characteristics of femininity. In stature a little above the average, her pel-

¹ Soc. Obst. et Gyn. May 14, 1891.

found in them. The kidneys were enormously hypertrophied, and especially the right one. The

vis was large, and hips prominent. Her breasts were well developed. Her skin was soft and fine, and a moderately thick panniculus adiposus spread over the trunk, and rounded out the limbs. There was no trace of beard on the upper lip or chin; the larynx was not prominent and the voice had the feminine timbre. Finally, her feelings and tastes were those of a woman. As the result of the examination an operation was declined. Not disheartened she gave herself up to a life of shame, and her lovers soon formed a vagina as well as surgery could have done it. At the end of a year the vaginal depression had acquired a depth of 5 to 6 cm. and later it measured 7 to 8 cm. In October, 1890, she was admitted to Polailon's service at the Pitié sick with a grave albuminuria. At this time the vagina was as long as an index finger and admitted a cusco speculum. The skin folded in between the bladder and rectum had taken the rosy tint and softness of a mucous membrane. The two small tumors had not changed any.

She died December 17, and the autopsy gave the following results:

The peritoneum covered the bladder, which was normal, and was then reflected upon the rectum, forming between the two organs a cul-de-sac. On the sides the peritoneum extended to the iliac fossæ, and formed no folds which could be taken for broad ligaments. But it formed two antero-posterior folds, projecting slightly, to which we shall again refer. The whole pelvic peritoneum was lined with a layer of smooth muscular fibres, disposed in interlacing bundles. On dissecting off the peritoneum there was no trace of ovaries or tubes found beneath it. Nor was there a uterus. But in the place where the uterus should have been found, below the recto-vesical cul-de-sac, there was a thickening of the tissues, forming a lump about the size of a bean. This lump was situated in the median line, a little above and in front of the bottom of the artificial vagina. It was so small that it was impossible to detect by vaginal touch. From each side of the lump in the median line, a cord passed obliquely forward, outwardly and downwardly, ending in the bodies contained in the inguinal hernias. These two cords were each composed of a conduit resembling a *vas deferens*, and of vessels encircling it. The inguinal tumors each contained an ovoid organ, white in color, with a smooth surface, and enclosed in a serous cavity analogous to a *tunica vaginalis*. The form and disposition of this organ differed slightly on the two sides.

On the left the large end of the ovoid was situated high in the inguinal canal; the small end was disposed in the form of a crinkled body which adhered to the inguinal ring, and which received the left cord. The serous tunic surrounded only the upper end of the organ, extending into the inguinal canal, but without communicating with the peritoneum.

On the right the organ was more rounded, shorter, more regular, and better projected from the inguinal canal. It had clearly the aspect of a testicle. It was surrounded by a vaginal tunic which adhered to its vaginal portion as far as the level of an epididymus thickening from which the right cord came out.

On each side a vasculaire bundle, which represented the spermatic artery and its veins, descended below the peritoneum to supply the inguinal organs, which were evidently testicles.

On a transverse section of the right gland there was seen, at the periphery, the *tunica albuginea*, and at the center, characteristic testicular substance. In a longitudinal section of the left gland there was likewise found the *albuginea* at the periphery, testicular substance in the center, and at the lower portion of the gland, the body of Hygmore, a rudimentary epididymis.

The histological examination, made in M. Cornil's laboratory, showed in the testicular substance seminiferous tubes, with thick, sclerosed walls, filled with atrophied epithelial cells. They were then two male

organs, but atrophied, sclerosed organs, and without physiological activity.

The attention of the histologists was also directed to the small retro-vesical lump, whence emerged the deferent canals. The question to be settled was whether it was a rudimentary uterus or a vestige of prostate. A very minute examination revealed only muscular fibers extending in various directions, but no cavity lined with epithelium, and no glandular formation. It was therefore neither a uterus nor a prostate, but simply a thickening of sub-peritoneal muscular tissue.

The neck of the bladder was then searched for the vestige of a prostate. At this point there was found a rounded organ which embraced the origin urethra, and resembled a small prostate. Microscopic sections showed that this organ was formed of muscular bundles, the interstices of which contained glandular formations. It was, then, a rudimentary prostate, but a prostate without prostatic utricle, and without ejaculatory canals. The *vesiculæ seminales*, moreover, were wanting entirely. On each side of the vulvar orifice were two very distinct vulvo-vaginal glands, with their ducts opening at the vulva.

On continuing the autopsy, there was found an interstitial nephritis of both kidneys, a congested and inflamed spleen, a well developed pancreas, and a liver of normal appearance. There were serous effusions in the pleural cavities and pericardium, and the heart presented a slight degree of endocarditis. A most striking feature of the autopsy was the small volume of the arch of the aorta, which could not admit the little finger into its cavity.

The genital anomaly classes this individual among the false hermaphrodites of the androgynous variety. In fact, Marie P. was a man. But the presence and very advanced evolution of the testicles had not impressed on the organism the characters of the male sex, or only some of these characters. On the other hand, a consideration only of the appearances and the external forms indicated a woman affected with an absence or imperforation of the vagina.

From the surgical standpoint, there was no indication for the creation of an artificial vagina, for there was no uterus, nor upper cavity, forming a vaginal vestige, toward which a route might be cut. Under these conditions it is the rule to withhold operation. In fact, in opening up the recto-vesical space to a certain extent, there is obtained only a limited conduit, with bleeding surfaces, which continually tend to reunite by cicatrization. The result obtained can not be kept because of the cicatricial retraction. But the observation of this patient shows that in similar cases a vaginal conduit can be slowly formed by pushing in the skin between the bladder and rectum with a large mandrel. In this way the bladder could be separated from the rectum, the vulvar mucous membrane pushed into a cul-de-sac, and a sort of vagina created, which could be subsequently completed and maintained by sexual approaches—*Journal de Médecine de Paris*.

THE COMBINATION of cocaine and antipyrin is said to produce a more lasting and complete anæsthesia than cocaine used alone. Dr. Martin (*Med. News*) suggests, for powerful local anæsthetic effect on the gum and sensitive dentine, the following solution:

Cocaine Hydrochlorate crystals, $\frac{3}{4}$ gr.

Antipyrin, 6 grs.

Water, 16 drops.

Our own observation inclines us to prefer 2 grains acetanilid to the antipyrin.—*New Remedies*.

BERLIN gives the carriages of physicians the right of way through the crowded streets. The coachmen wear a distinctive white hat.

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BY-LAW IV.—THE PUBLICATION OF PAPERS AND
REPORTS.

No report or other paper shall be entitled to publication in the
volume for the year in which it shall be presented to the Associa-
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LONDON OFFICE, 57 AND 59 LUDGATE HILL.

SATURDAY, JULY 18, 1891.

THE BACTERIOLOGY OF THE UTERINE CAVITY
IN ENDOMETRITIS.

Since the observations of Noeggerath, increased
attention has been devoted to infections of the
genital tract of women. Whilst it must be con-
fessed that the views of Noeggerath present
many striking facts in their support, yet it can-
not be denied that too much stress is laid upon
one inficiens, namely: the gonococcus, and
too little upon other pathogenic forms, that pos-
sibly play a most important rôle in these inflam-
mations. Our attention is again called to this
subject by Alexander Brandt, of Slarjansky's
Clinic, St. Petersburg, (*Centralblatt für Gynä-
kologie*, June 20, 1891), in an important prelim-
inary communication.

It consists of a careful bacteriological examina-
tion of the uterine cavity in twenty-five cases of
endometritis, presenting the following varieties:
E. hæmorrhagica, eleven; E. catarrhalés chron-
ica, nine; E. gonorrhœica, four, and E. septica,
one. Apparently every effort was made to ob-
tain the contents of the uterine cavity free from
admixture with the secretions of the cervical
canal, the latter being thoroughly cleansed be-
fore going beyond the internal os. The uterine

cavity was then scraped with a Volkmann spoon
and the removed portions examined microscop-
ically, and cultivations were made upon solid me-
dia. By cultivation, twenty-two of the twenty-
five cases showed the presence of microorgan-
isms. In two cases the streptococcus pyogenes
were identified. A pure culture of this germ was
obtained from the case of septic endometritis; in
two cases of hæmorrhagic and one case of catar-
rhal endometritis, the staphylococcus pyogenes
aureus were found; in two cases, alone, and in
one, associated, with the staphylococcus pyog-
enes albus. This latter germ was found, alone,
in two cases of the hæmorrhagic form.

Pure cultures of these germs were made ac-
cording to Koch's method, the results showing
that in seven cases, or 31 per cent., pathogenic
microorganisms were found. Inoculation ex-
periments were performed with the pure cultures,
demonstrating that in each instance the strepto-
cocci and staphylococci retained their full viru-
lence.

It will be readily admitted that the mere asso-
ciation of a lesion and the presence of a germ,
does not indicate a pathological nexus; indeed if
the latter is admitted, it does not follow that the
disease is the product of the germ. Still, if we
put these questions aside, for the moment, and
come to the treatment, we will find but few
surgeons, who do not believe in the prompt and
thorough removal of the suppurative bacteria.
When present upon a diseased membrane,
whether primary or secondary in their operation,
they can but do harm. Such being the case, we
conclude that the observations of Brandt, in
accord as they are with older researches, confirm
the value of antiseptics in the treatment of the
uterine mucosa, as indeed of all other mucous
membranes.

EARLY PREPARATION FOR THE SECTION
WORK.

The true foundation of the scientific work of
the American Medical Association lies in the Sec-
tion. It is there that the real work is done, and
the chief interest of members is found. The
general sessions may profitably discuss the broad
questions of medical education, ethics and legis-
lation which alike affect all, and in which all are
interested.

To our mind a continued growth, and increase

in the usefulness of the Association, largely depends upon a strengthening of the work done in the Sections. This, if accomplished at all, must be largely through the efforts and activity of the Section officers. There now remain eleven months before the next annual meeting at Detroit; it is none too soon to begin preparation for that meeting. We feel that we cannot urge this point too strongly, as we know that the Section work is commonly left to the two or three months preceding the date of meeting. This is all wrong, as it leaves too little time for the preparation of papers and discussions. The result is that the programme is often hurriedly made up and badly arranged, to the serious detriment of scientific work.

It is to be hoped that work will begin now for the next meeting. Section officers should begin correspondence with contributors, discussions should be arranged, and so far as possible the work mapped out. It will be found that there is none too much time for the preparation of a clean cut, well arranged programme.

We would especially call attention to the value of set topics for certain sessions, upon which one or two papers are prepared, and then several members are designated to take part in the discussion. This plan has worked well in many foreign societies, and has to some extent been adopted in our Association. Nothing is more attractive to a writer than to know that his paper will be intelligently discussed, and nothing contributes more to that end than a well arranged programme and precision in the work of the Section.

An effort will be made at the Detroit meeting to secure verbatim reports of the discussions.

NATURE'S FOOD.

Nature's food for the infant is the milk of the mother. That it is the best food for the infant is accepted by all. But this means that it is the best food for the healthy infant. Nature has not provided a food for the sick child, particularly not for the child suffering from bowel disorders. Statistics abundantly prove that a large majority of the infants dying from the bowel disorders of summer are to be found among those who have been deprived more or less completely of their natural nourishment. From this undisputed fact

it has been too often inferred that the proper food for the child affected with summer complaint is mother's milk, or in its absence that substitute which may be supposed most closely to resemble it. This is clearly a *non sequitur*. The conclusion should have been that the natural method of feeding the infant is a most excellent prophylactic against bowel trouble.

But to go farther, and to assume that a prophylactic measure will be a curative measure is clearly unwarranted. Vaccination will not cure variola.

The various efforts which have been made and are being made to imitate mother's milk, in its physical, chemical, and biological aspect, are worthy of the highest respect, but even should they reach an ideal conclusion, it will be to supply a food for the healthy baby, and not for the sick one. When sterilized milk was offered to the profession its advent was hailed by many as an important step forward in the feeding of sick babies, but its shortcomings are now becoming apparent, and are attracting the attention of medical writers.

The various abnormal fermentations which occur in the intestinal tract of the infant suffering with bowel trouble and which can be maintained by a milk preparation of one kind, can be maintained by a milk preparation of another kind. A microorganism which can grow in one milk food, can grow in any other milk food. To sterilize milk, and then introduce it into a nest of bacteria is a trifle illogical. And this illogical procedure has had its origin in the effort to imitate Nature's food.

If now, instead of stating with an hypothesis, the ground had been cleared of fetiches, and attention directed to the real problem, no doubt a much more tenable position would now be held on the subject of the proper food for a diarrhoeal baby. The starting point for observation is a simple one: Abandon all hypotheses, study the conditions present in the child, and adapt the food to those conditions, on principles which shall be comprehensive.

IMPURE ICE.

The heated term is upon us, and with the season comes the crave for cooling drinks. The carbonated drinks furnished by the shops are

usually healthful, but too frequently there is a temptation to indulge freely in the water of melted ice. This, when gathered from impure sources, is just as unfit for drinking and culinary purposes as any other stagnant water. Many have supposed that the freezing process effectually eliminates all impurities. That such is not the case is abundantly proven by the tracing of cases and epidemics of enteric diseases to the use of impure ice water. The germs of typhoid are not destroyed by the freezing of the water in which they are present. In urban districts where ice is manufactured from distilled water it should be given the preference for all household purposes. It being remembered that boiling the water destroys the harmful microbes, and freezing does not make them uninfectious.

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

Early in July the summer Medical Corps of the Board of Health commenced their two months' service in the tenement house districts of the city. There are fifty of these physicians, one for each district, and it is their duty to make house to house visits among the poor for eight hours daily; reporting twice a week at Sanitary Headquarters, to Dr. Moreau Morris, one of the most experienced officers of the Board of Health, who has special charge of this department of its work. They are required to seek out and treat all cases of disease, especially among children, which are not already being cared for by private or dispensary physicians, to give advice in regard to the care of infants and young children in hot weather, and in regard to sanitary matters in general, and to promptly report all nuisances and all cases of contagious disease met with. They distribute in every household copies of the Board of Health's "Rules for the Care of Infants," printed in French, German and Italian, as well as English, and are also provided with free tickets for the salt water excursions of the St. John's Guild Floating Hospital, which they furnish to all suitable cases. The city appropriates \$10,000 for carrying on this work, each physician receiving \$200 for his two months' service, and the salaries are certainly well earned, for the duty is a most laborious one, and the mere physical exertion of climbing to the top floor of one five-story tenement house after another, in the hot weather, is no trifling matter.

There can be no question that this house to house service is of very considerable importance in keeping down to some extent the infant mortality which is, unfortunately, always so extremely large in the summer months in a great city like New York; and the special usefulness

of it is no doubt to be found in the fact that by this means many cases of diarrhoeal disease are discovered and treated in their incipency, which would otherwise be permitted to run on without interference until all medical aid would be useless. The extent of the work can be readily seen from the statistics of the summer corps of physicians in the season of 1890, which are as follows: Number of tenement houses visited, 40,364; families visited, 321,012; sick cases treated; minor nuisances abated by personal effort, 5,413; complaints of nuisances forwarded, 551; circulars in regard to the care of infants distributed, 51,784; tickets to the St. John's Guild floating hospital excursions, 16,627. In the city of Brooklyn the same plan of summer service has of late years been adopted, and there are now some twenty physicians engaged in the work there.

In connection with the saving of infant mortality, it may be mentioned as a matter of interest that one of the large down-town dispensaries (the Eastern), has commenced the preparation, under the supervision of a competent physician, of sterilized milk for the use of the poor of the neighborhood. It is supplied at a low price to those who can afford to pay for it, and gratuitously to those who are unable to do so. It has been claimed by the well-known authority on the subject of milk, Dr. E. F. Brush, that children fed exclusively upon milk that has been devitalized by sterilization are not as efficiently nourished as those fed on unsterilized milk; and the remedy which he would suggest for the poor character of milk so generally in use, is reform in the dairy itself, an important feature of this reform being the spaying of all heifers to be used as milch cows. But, even if Dr. Brush is right, it will be a long time before the milk supply for the poor of our great cities is what it ought to be, and the best milk even is liable to contamination and rapid changes in hot weather. The general sterilization of milk in hot weather at least (granting that his views are correct), would therefore seem to be the lesser of two evils; and, leaving out of the question the matter of possible tubercular infection through unsterilized milk, there would undoubtedly be a decided diminution in the infant mortality from diarrhoeal diseases if the various similar institutions throughout the city would follow the example of the Eastern Dispensary in supplying sterilized milk.

During the early part of July the number of deaths reported in the city, while sufficiently large, indeed, has been considerably smaller than the average for the same period during the last five years, and this is no doubt due in great measure to the unusually cool weather that has prevailed. A very large proportion of all the deaths, however, have been among children under one year, and most of these have been carried off by diarrhoeal diseases. There is always, naturally, a diminution in the number of deaths from respiratory diseases at this season of the year, and there has also lately been a marked falling off in the deaths from contagious and infectious diseases. In one week recently (that ending July 4th) there were only two deaths from typhoid fever reported in the city—a most unusual and gratifying circumstance.

While the eye witnesses of the four executions at Sing

Sing prison on the 7th of July have been bound to secrecy, and no newspaper reporters were permitted to be present, it seems to be perfectly clear that on this occasion the method of electricity proved an unequivocal success, death in each instance being instantaneous and entirely painless. One of the physicians who was present at the execution of Kemmler, and also at Sing Sing, Dr. C. M. Daniels, of Buffalo, has been rather more communicative than the others, and he states that while he never had the slightest doubt that Kemmler's death was instantaneous and painless, the Sing Sing executions were a great improvement over his, being systematic, well planned, and perfectly carried out in every detail. "There was," he says, "no absence of head to direct and control, as at the Kemmler execution. Every man who took part in the execution knew exactly what was expected of him and what responsibility rested on him, and if there had been any blame to place after the executions it could not have been thrown from shoulder to shoulder, as it was after the Kemmler execution."

Dr. A. P. Southwich, the originator of execution by electricity, who was also present at Sing Sing, has expressed himself as completely satisfied with the result. He is reported as saying: "The executions were a success in every way, and there was not the slightest hitch. Electric execution has come to stay. These executions have demonstrated that the method is humane."

P. B. P.

The Amenities of Medical Discussion.

To the Editor:—The readers of THE JOURNAL, who are interested in the legal side of their profession may remember an article in the issue for May 2, 1891, on "Medical Cases in the Courts," in which was a paragraph entitled "Cosmetics and Spectacles in Court." They may also have noticed a savage attack on the writer in the issue for June 6, 1891, under the title of "The Optician and Ophthalmology."

It has been said that physicians show more bitterness in their discussions of unsettled questions than members of other professions, and it would seem as if this article tended strongly to prove the statement.

If reference is made to the articles it will probably be admitted by every unprejudiced person that the lawyer made a candid and even tempered statement, while the physician or ophthalmologist, if he prefers so to be styled, made a violent, and uncalled for attack and lost control of himself in the heat of the argument.

The doctor in question, Dr. George M. Gould, goes so far as to say that the article should have been excluded from the pages of a journal caring for scientific medical progress.

Perhaps the editor of THE JOURNAL will be pleased with the snub so felicitously given him, and it might be well for Dr. Gould to send a comprehensive statement of his opinions to all the medical journals of the country, and demand that nothing be admitted which varied from them.

No doubt Dr. Gould's standing in the profession is such that a request of this sort coming from so promi-

nent a gentleman would be most humbly acquiesced in.

A considerable portion of the paragraph is quoted by Dr. Gould for the purpose of heaping contumely upon it, but he seems to be unconscious that it is merely restatement of the opinion and reasoning of the French Court on the question at issue.

Possibly he intends to ridicule the decision of this court, but those persons who rail at judges do not usually commend themselves to the approbation of the public.

Dr. Gould says that when a layman (referring to the writer) attempts to say anything about medicine he takes the side of ignorance and untruth and makes a mess of what he has to say.

If Dr. Gould will take the trouble to read the article he will probably find out, that the writer did not undertake to give any opinion whatever about medicine but rather about law, and possibly on such subjects he is as well qualified to speak as Dr. Gould.

Nothing was said in regard to the respective merits of the optician and the ophthalmologist in treating weak or diseased conditions of the eye, but the opinion was given that, as a matter of law, the optician, when he furnishes glasses believed to be suitable for a customer, does not violate the medical license laws of this country.

Why the expression of such an opinion, which is entirely within the proper scope of a writer on medical law, should excite such unbounded wrath it is difficult to understand, except on the theory that Dr. Gould is in some way the duly examined, licensed and appointed protector of his profession. The writer did not say or intimate in anyway that the optician knew as much about the eye as an ophthalmologist, nor did he approve even by inference of ignorance on the part of the optician. On the contrary he believes very strongly that the better medical education the optician has the more certainly will he be able to give the right glasses to a customer.

If Dr. Gould means to say that a person selling glasses in an optician's store, after endeavoring to fit them to the needs of the customer, is liable for a breach of the medical license law, he should make such a statement boldly.

The writer expressed the opposite opinion. In either case it is really an opinion about law and not about medicine, and consequently the whole of Dr. Gould's tirade finds no sound basis.

The writer, not having the fear of Dr. Gould before his eyes (in this case no glasses at all are used, the sight being perfect), reiterates his opinion that the optician who sells glasses does not violate the medical license law any more than does a person in the establishment of an artificial limb manufacturer who sells a cork leg to a customer.

If Dr. Gould believes the contrary he should at once get up a test case in his own city of Philadelphia, where there are no doubt numerous opticians who daily sell glasses to customers.

It will, however, be probably a rather disheartening drawback to him to know that he must convert the district attorney to his view before he can make much progress in the effort to root out the opticians.

HENRY A. RILEY, A.B., L.L.B., New York.

The Hypodermatic Use of Quinine.

The following communication addressed to a subscriber so fully covers the subcutaneous use of quinine, that he has asked and obtained permission to have the same published.

Dear Doctor:—I take great pleasure in replying to your inquiry in regard to the hypodermatic employment of quinine. I generally use the sulphate, adding dilute sulphuric acid, drop for grain, then water enough to make one syringeful—25 to 30m. Sometimes a drop or two more of the acid is necessary. Five grains is the usual quantity for a syringeful, and in giving larger quantities (I usually give 10 gr.) I repeat the injection. The solution is always made as wanted, the injection made into muscle or deep connective tissue, as in the lumbar region. I have never seen an abscess or had one occur when given in this way. Usually there is some tenderness. In one case where the apothecary used strong H_2SO_4 and gave 10 gr. in one injection, in the arm, there was a small slough, hardly involving more than the epidermis. I am inclined to believe he had an excess of acid. In another case the resident divided the dose unequally and gave about 8 gr. in one side of the back, the rest, 10 gr., in the other. In the region of the first, on the following day, there was a soft, deep-seated swelling about the size of a silver dollar, with pain all over that side. The side was painted with iodine and pain and swelling subsided, though there was some left on the patient's leaving on the second day. One patient had 30 such injections with almost no pain, and without local evidence.

I have used the bi-muriate with urea, but could see no advantage. Have often intended to experiment with other solutions but so far have not done so. Quinine is given in this way very often in Texas, usually in cases where the danger of an abscess would not weigh with that of risking any other method.

I have given it often merely to see the local effect.

Very truly yours,

GEORGE DOCK.

GALVESTON, TEXAS, June 13, 1891.

Inter-Continental American Medical Congress.

At the regular quarterly meeting of the Golden Belt Medical Society, of Kansas, held in Junction City, Kansas, July 3d, 1891, Dr. W. B. Dewees, President of the Golden Belt, having been appointed a member of the Auxiliary Committee of the Inter Continental American Medical Congress, presented the following resolutions, which were passed unanimously:

Resolved, That this society heartily approve of the permanent organization of the Inter-Continental American Medical Congress, believing it to be of material benefit in promoting the interests and welfare of the medical profession of America.

Resolved, That the members of this society will do all in their power to promote the interests and welfare of the Congress.

Resolved, That the Secretary of this society is hereby instructed to forward a copy of these resolutions to the

Kansas Medical Journal and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION for publication.

F. B. BROWN, M. D.,

Secretary Golden Belt Medical Society.

Salina, Kansas, July 9, 1891.

Section on Materia Medica and Pharmacy.

To the Editor:—On behalf of the officers of the Section on Materia Medica and Pharmacy of the American Medical Association, I invite the members to prepare papers to be read at the Detroit meeting of the Association. The first meeting of this section was held at Washington last May, and proved successful in every respect. The titles of papers for the section should be submitted as soon as determined. It will not be necessary to submit the article until a date nearer the coming meeting; for further information address the secretary of the Section, DR. H. M. WHELPLEY, St. Louis.

NECROLOGY.

John Frederick May, M.D.

Dr. John Frederick May was born in the city of Washington, D. C., May 19, 1812, and died of pneumonia, at his residence 2022 G. street, n. w., May 1, 1891. He was the son of Dr. Frederick and his wife, Julia Matilda (Slocum) May, of this city, who were married in 1811.

Dr. Frederick May was a native of Boston, Mass., born in 1773, and a graduate of Harvard College, both in letters and medicine, writing his thesis on *Tetanus* in Latin, a copy of which may be found in the "Toner Collection," Library of Congress. He received his medical degree in 1795. He studied medicine with Dr. John Warren, brother to the patriot, Dr Joseph Warren, who was killed in the battle of Bunker Hill.

The father of the subject of this sketch settled the same year of his graduation in the, then, infant capital of the United States, five years before the archives of the Government and the executive offices were removed hither. He brought with him letters of introduction to the leading men here at that time; Daniel Greenleaf, for whom Greenleaf's Point is named; Hon. Wm. Cranch, the first presiding judge in the District of Columbia; Notly Young and others. He was a man of genteel and scholarly tastes and possessed excellent business habits, fully identifying himself, from the first, with the interests of the city. He acquired real estate and encouraged business enterprises; was one of the incorporators, and a director for building the first bridge over the Potomac river where the Long Bridge now crosses. He was, also, a promotor of the extension of the Chesapeake and Ohio canal through the city. He was an early and earnest advocate for schools, and filled the chair of Obstetrics in Columbia College from the organization of the medical department in 1825 until his resignation in 1839. For years he enjoyed the leading, and a large practice in obstetrics, and was well qualified to discharge its responsible duties. As a physician he was justly popular, and as a lecturer, entertaining, and at times, pathetically elo-

quent. His wife, Julia M., died October 14, 1823, leaving a family of eight children—six sons and two daughters. The doctor did not marry again, but devoted himself to the education of his children, and had the satisfaction of seeing them all well fixed in life before his death, which did not occur until July 23, 1847. His father—the grandfather of John Frederick—was Col. John May, a leading Boston merchant in his day, and one of the patriots of the Revolution, who, in 1773, disguising themselves as Indians, threw a cargo of tea overboard into Boston Harbor. Col. May's immediate ancestor was Capt. May, a man noted for his courage and prowess in defence of New England against the Indians. The May family came originally from England and settled in Massachusetts in 1632.

Dr. John Frederick, to whom was given the first name of both father and grandfather, came thus of brave and courageous stock, who were among the leading citizens of the community in which they lived. He received a collegiate education at Columbia College, and took his medical degree from the same institution in 1834. Shortly after this, he went to Europe, where he spent more than a year in professional study in the leading hospitals of London and Paris. In this way he familiarized himself with all the latest advances in medicine and surgery. After an extended tour through Europe, the West Indies and the United States, he began to practice in his native city. He joined the Medical Association of the District of Columbia in 1838, his father being president of that body at the time. In 1840, he became a member of the Medical Society of the District. This organization his father assisted in founding, his name appearing in the original charter of 1819, and also in the amended charter of 1838.

In 1839, Dr. John Frederick May was elected to the "Chair of Anatomy and Physiology" in the Columbian College. In 1841, he was transferred, by consent of the faculty, to the "Chair of the Principles and Practice of Surgery." This position he filled most acceptably until his resignation in 1858. He was honored, about the same time, with the professorship of surgery in the University of Maryland, which he filled for two years without vacating his college duties in Washington, and to the satisfaction of his associates in both faculties. Dr. May became also a member of the Section of Physiology and Medicine of the "National Institute" in Washington, a scientific organization antedating the existence of the Smithsonian Institution of this city. This association of physicians was active in 1843, and for a number of years sent delegates to the American Medical Association. Eventually, however, it was merged into, or its functions were absorbed by the Smithsonian Institution. The "Pathological Society of the District of Columbia" was formed about 1846, Dr. May taking an active and influential part in its discussions. In 1848, Dr. John Frederick May was united in marriage with Sarah Maria Mills, by whom he had seven children—six of whom are living, two sons and four daughters. The family of the May's have been noted, for generations, for their fine physical development, bright intellects and honorable traits of character.

In 1847, Dr. May became a member of the American Medical Association, being a delegate from the Medical Department of the Columbian College. In 1858 he was elected to the Chair of Surgery in the Shelby Medical College at Nashville, Tenn., which he filled very acceptably until the breaking out of the "Civil War."

Although Dr. May is best known by his splendid record as a surgeon, he was, throughout his professional career, a general practitioner, and was equally astute, strong and able in each and all the departments of medicine. He took, it is true, great pains to qualify himself as a surgeon, making special studies in anatomy, and equipping himself with the best instruments devised for the different operations obtainable either at home or abroad. Being a man of fine physique, over six feet in stature, and well proportioned, calm and self-possessed, with clear convictions and steady nerve, he was every way suited for the duties and responsibilities of the surgeon. His skill in surgery speedily attracted attention, and placed him in the very front rank of this field of practice in the United States. He was one of the first surgeons of America to amputate, with success, at the hip joint, and the first in Washington to perform ovariectomy. His skill in surgery was widely recognized, so that for years most of this kind of practice in the city of Washington fell to his care. He was surgeon to the Washington Infirmary, which was conducted under the auspices of the faculty of the National Medical College, in which he was the professor of surgery.

Dr. May was punctilious in his intercourse with his professional brethren and with the public, but he was at the same time the soul of honor. He was always ready, on a proper basis, to render service to the afflicted and to advise and assist the young practitioner in difficult cases. He loved his profession, and esteemed the man who, by his merits, won the approbation of the medical fraternity.

Dr. May, while he was a good surgeon and physician, was also an excellent business man, attentive to business matters, making good investment, and accumulating a large and productive estate. He was earnest and zealous in whatever engaged his attention, whether it was his profession or his business investments. In all his affairs he brought a clear, strong judgment to bear, and wasted nothing on sentiment.

Shortly after the war Dr. May removed to the city of New York. He continued, however, to spend much of his time in Washington, attending to his real estate and other business interests. His family, however, returned to reside in this city about 1880. In 1884 he was elected surgeon on the consulting staff of "Garfield Memorial Hospital." He served here faithfully and as president of the medical staff for five years, when the necessity for lessening his duties, owing to the accumulation of his years, induced him to resign.

Of late the Doctor has been a great sufferer from asthma, and particularly at certain seasons of the year. He tried various climates and many places, at the sea level and at high altitudes, but found no place affording more than a modified exemption.

One of his sons, William May, is treading in the foot-

steps of his father, having studied medicine, and being now in full practice, with a predilection for surgery.

Dr. May's funeral took place from St. Paul's Church, Twenty-third street, and was largely attended by the profession, private citizens and former friends of the Doctor's. The Rev. Dr. Harding conducted the Episcopal services. The remains of Dr. May, followed by a large cortege, were placed in Rock Creek Cemetery.

J. M. T.

BOOK REVIEWS.

PRACTICAL PATHOLOGY AND MORBID HISTOLOGY. By HENEAGE GIBBES, M.D., Professor of Pathology in the University of Michigan, etc. Pp. 320, cloth, 8vo. Philadelphia: Lea Bros. & Co. 1891.

In the olden times, instead of writing a preface, the author wrote an "apology" for having written a book at all. One should now-a-days be very sure that there is need, when he undertakes to write a new book. Our author finds the need of a new book on the subject of which he treats, in the fact that photographic illustrations of actual appearances are needed to fill an existing gap in the domain of morbid histology; and the fact must be admitted that our monographs and text-books are filled with illustrations which are rather diagrammatic, than representative of an actual specimen. There is sufficient reason why this should be the case, and that is a pecuniary one. It has been pretty well demonstrated that, in the existing condition of the art of lithography and engraving, we cannot reproduce on ordinary paper, either faithful photographs or well worked out engravings; a higher class of paper must be used; this necessarily increases the cost of the book. The recognition of this fact has heretofore led publishers, both in Europe and America, to publish fine illustrations, when the character of the book required it, on separate sheets from those on which the text of the book was printed, and it may be safely said without successful contradiction, that the book under review affords abundant proof of the wisdom of the common practice. The publishers have endeavored to surmount the difficulty by printing the entire book on extra heavy paper, but a comparison of the illustrations will show that there is still lacking that quality which would bring out distinct tracings. Take, for instance, the illustration of spindle celled sarcoma on page 165, and it is impossible to resist the conclusion, either that the section was cut too thick, or that it was slightly out of focus when the photograph was taken. Photomicrographic negatives are notoriously difficult to reprint from, even with the most careful attention to details, owing to difficulties of illumination, and the fact that, as a rule, they are

made by amateur photographers and not by experts. A comparison of the illustrations in this work with those in Peyer's Atlas of Clinical Microscopy, will show very plainly the difference between photomicrographs reproduced in the book pages and those on separately printed boards. The book itself affords an excellent example of the difference in class and clearness, if one compares the beautiful plate in the frontispiece with the out-of-focus picture on page 177.

The text of the book, so far as it relates to morbid histology, is excellent, and fairly embodies the latest teachings; that with reference to the preparation of specimens, the use of the microscope and the laboratory technique is to be commended. The chapter on practical bacteriology is one of the best in the book, which as a whole compares favorably with others on the subject of which it treats.

COLLECTED CONTRIBUTIONS ON DIGESTION AND DIET, BY SIR WILLIAM ROBERTS, M.D., F.R.S. Philadelphia: Lea Bros. & Co. 1891.

This volume consists mainly of a reprint of the author's Lumbian Lectures on the "Digestive Ferments and Artificially Digested Food," and five lectures on "Dietetics and Dyspepsia" given at the Owens College in 1885. It also contains the other publications of the author on kindred subjects. The subject matter is divided into four sections:

1. Digestion, and the Digestive Ferments.
2. Dietetics.
3. Preparation of Food for Invalids.
4. Dyspepsia.

The section on Dietetics is replete with suggestions on practical points. It discusses many points which have been observed by the clinician, but have not yet reached the more exact physiologist. These ultra-physiological facts of digestion, are of the highest importance to the practitioner, if he be familiar with the facts of digestion as already determined by the physiologist and chemist. The book is in many respects one of the most satisfactory productions on the subjects of which it treats, that has appeared in recent years.

MEDICAL REGISTER OF NEW YORK, NEW JERSEY AND CONNECTICUT, 1891-1892. Published under the supervision of the New York Medico-Historical Society, Wm. T. White, M.D., editor. Vol. 29, press of G. P. Putnam's Sons. This is certainly the most complete physicians' register that has come into our hands. It contains the names of 7,854 physicians, of which there are in New York State, exclusive of New York city and Brooklyn, 3,65; New Jersey, 961; Connecticut, 611; New York city, 2,325; Brooklyn, 778. The increase over last year is 205. Not only does the register of physicians

seem to be complete, but there is also a large amount of useful information, tersely stated, not one line of which would we desire to have omitted.

AN ELEMENTARY HAND BOOK ON POTABLE WATER. By Floyd Davis, M.Sc., Ph.D. Boston: Silver, Burdett & Co. 1891.

A good little book, containing chapters on Pure Water, Inorganic Constituents, Vegetable Constituents, Animal Constituents, Microorganisms, Water Supplies, Natural Purification, Artificial Purification, Systems for Central Filtration, and with an Appendix, having, under Sec. A, The Origin and Home of Cholera, and under Sec. B, Qualitative Tests for Impurities in Drinking Water.

MEDICAL PUBLICATIONS.—HARVARD MEDICAL SCHOOL. 1890.

The preface says: "The following articles are presented in bound form to show the character of the original work done by the instructors of the school, or under their personal supervision." The volume contains eighteen papers, the majority of which have had their origin in the physiological laboratory. The articles, nearly all of which have been published elsewhere, are of the highest scientific standard and are worthy of the great University which fathers them.

MISCELLANY.

DR. W. S. CHRISTOPHER has resigned the chair of Theory and Practice of Medicine in the University of Michigan to take the chair of Diseases of Children in the Chicago Polyclinic.

WANTED.—A few copies of No. 1, Vol. xv, of THE JOURNAL; will pay good price. Send to this office.

DR. H. M. WHELPLEY, professor of Microscopy in the St. Louis College of Pharmacy, and for the past five years a lecturer in the Missouri Medical College, has been elected Professor of Physiology and Histology, and Director of the Histological Laboratory of the latter institution. The doctor has also accepted the position as Secretary of the faculty.

VERMONT STATE MEDICAL SOCIETY.—The following papers will be read at the next annual meeting of the Vermont State Medical Society, to be held at Burlington, October 15 and 16:

1. Summer Diarrhoea in Children, H. D. Holton, Brattleboro. Discussion opened by C. F. Camp, Barre, G. F. B. Willard, Vergennes.

2. Predisposition to and Prophylaxis of Phthisis, A. B. Bisbee, Montpelier. Discussion opened by S. T. Brooks, St. Johnsbury, E. A. Bates, Highgate.

3. The Treatment of Phthisis, A. C. Bailey, West Randolph. Discussion opened by A. P. Grinnell, Burlington, O. W. Sherwin, Woodstock.

4. Recent Advances in Surgery, L. M. Bingham, Burlington. Discussion opened by Henry Janes, Waterbury, F. D. Robertson, St. Albans.

5. The nature, varieties, causes, symptoms and treatment of Glaucoma, J. H. Woodward, Burlington. Discussion opened by C. E. Chandler, Montpelier, F. T. Kidder, Woodstock.

6. Some European Lessons, J. H. Jackson, Barre.

7. Puerperal Septicæmia, H. R. Wilder, Swanton. Discussion opened by C. F. Branch, Newport, H. S. Brown, St. Johnsbury.

8. Heart Sounds and Cardiac Murmurs, D. C. Hawley, Burlington. Discussion opened by J. H. Jackson, Barre, D. F. Rugg, Hartland.

9. A Study of New Remedies, W. H. Vincent, Orwell. Discussion opened by E. J. Hall, Morrisville, F. R. Stoddard, Shelburne.

10. Albuminuria, its Detection and Significance, F. L. Ladue, Alburgh Springs. Discussion opened by Geo. B. Nichols, Barre, W. D. Huntington, Rochester.

11. Pure drinking water and how to secure it, J. H. Hamilton, Richford. Discussion opened by J. D. Hanrahan, Rutland, C. G. R. Jennings, Bennington.

12. Indigestion and its Relation to Disease, C. W. Peck, Brandon. Discussion opened by Edw. R. Campbell, Bellows Fall, C. W. Jacobs, Richmond.

13. Preventive Medicine, C. S. Caverly, Rutland. Discussion opened by S. S. Clark, St. Albans, E. W. Shipman, Vergennes.

14. The Upper Air Passages and their Diseases, O. B. Douglass, New York. Discussion opened by J. H. Woodward, Burlington, S. W. Goss, Chelsea.

15. Acute Capillary Bronchitis in Children, W. G. E. Flanders, Fairfield. Discussion opened by Joel Allen Johnson, E. P. Stinson, West Randolph.

16. Patent Nostrums, L. W. Flanders, Burlington. Discussion opened by H. T. J. Howe, Waitsfield, C. J. Russell, Hinesburgh.

17. Shall we Abolish the Lecture System in our Medical Schools? O. W. Sherwin, Woodstock. Discussion opened by A. T. Woodward, Brandon, Geo. Dunsmore, St. Albans.

18. President's Annual Address, J. N. Jenne, St. Albans.

This announcement is issued in order that every member of the Society may have ample opportunity to come prepared to discuss the various papers.

It is especially urged that each member appointed to discuss a paper make special preparation to do so, and that any member who will be unable to fulfil such appointment, notify the Secretary before October 1.

It is expected that other papers will be offered for the programme, and all members are reminded that volunteer papers are always in order.

The annual Banquet will take place on Thursday evening, October 15, after the President's Address, with Prof. J. H. Jackson, of Barre, as Anniversary Chairman.

There will be the usual exhibit of drugs, medicines, surgical instruments and appliances, etc.

It is expected that the usual courtesy of half-fare will be extended by the railroads.

The regular programme will be issued October 1.

D. C. HAWLEY, M.D., Sec'y.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from July 4, 1891, to July 10, 1891.

Asst. Surgeon James W. Buell is retired from active service, by reason of disability incident to the service.

Asst. Surgeon William S. Owen, Jr., detailed to attend the encampment of the Illinois National Guard, near Springfield, Ill., from July 18 to 25, and August 11 to 18, 1891.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending July 11, 1891.

Asst. Surgeon Robert Boyd, ordered to the U. S. receiving ship "Dale," Washington, D. C.

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ORIGINAL ARTICLES.

APPENDICITIS AND PERICÆCAL INFLAMMATION. WITH NOTES OF CASES ILLUSTRATING UN- USUAL DIFFICULTIES IN DIAGNOSIS.

*Read before the Section of Surgery and Anatomy, at the Forty-
second Annual Meeting of the American Medical Association,
held at Washington, D. C., May, 1891.*

BY THOS. G. MORTON, M.D.,
OF PHILADELPHIA, PA.

This subject within the domain of abdominal surgery within recent years, has made such decided progress, or is at the present time, attracting more attention than that of operation for internal lesions, whether due to traumatism or case.

The fact that perforation so frequently complicates perityphlitis, brings the question of the management of such cases prominently before us surgeons, and requires that we should not entertain decided convictions as regards the pathology of the affection, but also have well-weighed opinions as to the details of operating, upon the time when such operation should be performed with the least risk to the patient, with the prospect of the most successful result.

I.—ANATOMY, PATHOLOGY, AND DIAGNOSIS.

Appendicitis, simple or perforating, with resulting perityphlitic inflammation, or pericæcal abscess, is a comparatively common pathological accident; and its diagnosis and treatment depend both to medicine proper and to surgery. Most invariably the case is first seen by a physician, and, as the records will prove, very much depends upon his ability to promptly diagnose the morbid condition, and to appreciate the importance, in certain cases, of early surgical intervention for its relief, and on the other hand, the gravity of the responsibility assumed in delaying operative procedure until the patient is in a bad condition, or fast approaching it. Upon the physician also usually devolves the duty of informing the family of the patient, or the patient himself, of the peril he is in, and of con-

vincing them that delay is indeed dangerous when an abscess has formed adjacent to the appendix vermiformis, and peritonitis is threatening or is actually in progress. The surgeon is interested especially in the diagnosis and details of operation, and in any special dangers or difficulties attending it.

I have thought therefore that this would be an appropriate topic to bring before this section for discussion. Moreover, this subject is attracting a great deal of attention at the present time; so much so, indeed, that the American Surgical Association, and other societies have repeatedly had it up for consideration within the last few years, and it has more than once received contributions from our own proceedings. At its meeting in December, 1887, three papers were read before the County Medical Society of Philadelphia: One on the "Pathology of Pericæcal Inflammation," by Dr. John H. Musser; one upon "Diagnosis," by Dr. William Pepper; and one upon "Treatment," by myself, by invitation of the society. In my communication, the indications for the operation, its technique, and details of after-treatment, were clearly indicated. I may say now, more than three years later, that subsequent events have not led me to abandon, but rather to confirm, the views then expressed as to diagnosis and treatment. I then presented a case which had been operated upon by me in the spring of 1887, in the manner prescribed in that paper, which made an excellent recovery after removal of an ulcerated and perforated appendix. I have reported a number of others since that time, showing the importance of early diagnosis, prompt operation, exploration of the abscess cavity and removal of the cause of the mischief. The case just referred to, I may say, was the first recovery on record, so far as I am aware, where the radical operation of amputation of the appendix was deliberately undertaken for the relief of pericæcal abscess. This alone is sufficient to show how recently the subject has claimed the attention of the profession.

This operation just referred to, has already become one of the established procedures of surgery. It is somewhat surprising, therefore, to learn that some surgeons still use the aspirating needle in the diagnosis of abscess, and do

not consider it of vital importance even to remove the appendix in the treatment. And yet this is what a western surgeon reports that he witnessed when on a recent visit to the Metropolis (*American Practitioner and News*, Louisville, Ky., Vol. x, page 380).

This, to say the least, betrays a deplorable want of agreement among surgeons and teachers of surgery as regards one of the most vital questions of operative treatment, and even the means of diagnosis.

I think that the present state of abdominal surgery will support me in stating that, as a rule, in any abscess of the ileo cæcal region, appendix disease should be suspected, and in such case the organ should always be sought for, in order to ascertain its condition; unless this is done the very first principles of correct treatment are violated. If a diseased appendix be permitted to remain it is liable to set up further mischief. In such a case, as the rule, the future welfare of the patient demands that it should be excised, unquestionably so if inflamed, perforated, or containing foreign bodies.

It seems surely as if enough had been said, with regard to the dangers of using the exploring needle, of its utter unreliability, and of its inability to afford information of any value in these cases, to cause its complete abandonment, especially by surgeons who occupy important and responsible positions as teachers and operators, and who aim to serve as guides for others.

A brief review of the pathology of appendicitis, I think, will make it clear to us all, that the life of the patient often depends upon the ability of the medical attendant to promptly recognize the cause of the disease, and to early institute the proper measures for its relief and very often its removal, as the only way to afford relief and permanent safety to the sufferer.

In taking up the systematic discussion of this subject it is perhaps better to very briefly recall the anatomical relations of this part of the body, and the position of the appendix in health and disease.

Anatomy.—From a number of dissections of bodies where death has been produced by disease not affecting this locality, made by me and under my direction at the Pennsylvania Hospital, and elsewhere, I can supplement the very meagre and often incorrect notices of the anatomy of the appendix usually contained in our text-books. In the first place the opening into the appendix from the cæcum is not patulous, as it is represented ordinarily; this opening is also occluded by any abrupt change of direction of the process by which it often becomes parallel with the bowel. This places a valvular fold of mucous membrane directly over the opening which usually closes it as effectually as the foramen ovale is closed in the heart during the first few days

after birth. Moreover, it is stated by good authority that the calibre of the appendix internally is about the size of a goose quill. I question very much the accuracy of this statement in any case, as I have never found it to be anything approaching this size in health; and rarely, if ever, is it distended throughout its course, by secretion to such an extent as this; ordinarily there is no cavity at all, as the walls are collapsed, and I have found that a good sized probe was as much as could freely pass through the canal.

The opening into the appendix is visible upon the inner (left) side of the lower and posterior extremity of the cæcum; it is covered with the fold of mucous membrane and occluded by mucus under ordinary conditions. Were this not the case, and the opening patulous, as is so frequently figured (especially if the calibre were as large as some have represented), appendicitis would be a far more common affection than it is; and, indeed, few children would live to attain the age of adult existence. In length, the appendix varies from two to five, or even nine inches, as I found it in one case. It varies in normal position and direction; so that it can scarcely be said to have a normal position; most frequently it is found upon the posterior and inner (or left) side of the cæcum and ascending colon, extending upward towards the liver or gall bladder, to which it may be adherent. The free extremity often points toward the spleen, but it may fall down into the pelvis, and become adherent to the broad ligament or right ovary, or it may become twisted around the small intestines, forming a loop which may cause obstruction or strangulation of the bowel, or finally it may become part of an inguinal or scrotal hernia. At its base the appendix joins the cæcum, obliquely, on the posterior and inner side, just below and on the same side as the ileo cæcal valve, but not at the lowest portion of the cæcum. The summit of the appendix and free extremity is rounded and imperforate. Upon splitting it open, longitudinally, you notice the comparatively great thickness of the walls, both the mucous coat and submucosa being well represented. The glands in the mucous membrane secrete a small amount of mucus, which, with the epithelial debris, is gradually discharged into the cæcum. Should the opening into the cæcum become impervious from any cause, the secretions may gradually accumulate and become inspissated, forming casts or round balls, resembling cherry stones, but consisting of sandy and organic matter. Such secretions are very common.¹ The follicles of Lieberkuhn are numero

¹ In 13 consecutive post-mortems made by me in persons who died from other causes than intestinal disease, the appendix in every instance but one contained fecal concretions. In a number the foreign bodies were quite soft, others were firm, some gritty, yellow or brown in color. The canal of the appendix in several was blocked for an inch or more by a series of such fecal masses which resembled mice dung. Such material imprisoned may readily excite irritation, inflammation, ulceration and finally perforation and abscess.

in the appendix, and the agminated Peyerian glands are also well developed near the summit of the tube, according to the late Prof. Henry H. Smith, who was also inclined to think that a gland or two of Brunner might also be present. In the lower animals, especially among the rodentia, the appendix is much larger than in man and is so richly endowed with glands as to fulfil an important purpose in digestion. The canal of the appendix is also relatively, much larger in the infant than in the adult.² In the newly born infant the appendix frequently contains meconium.

Dr. Formad, Coroner's Physician and Pathologist in the Philadelphia Hospital, confirms the above observation with regard to the presence of glands in the appendix, and states that he had frequently met with typhoid and tubercular ulcerations and catarrhal changes in the vermiform appendix as a part of a general disease of the mucous membranes of either the large or small intestines. He also has found "Fæcal matter and concretions exceedingly common in the vermiform appendix, surely much more common than is generally held."³ Authentic cases have been recorded by Morgani, John Hunter, Meckel, Haller and others, where the appendix was wanting in otherwise normal individuals. I think that as regards its functions nothing need be said. Whatever relation it may have to the act of digestion in some of the lower animals, in man it is merely a rudimentary organ, having no function, since it may be naturally absent without affecting the health of the individual, and after its removal by operation, the patient has perfect digestion and suffers no inconvenience from its loss. Speaking from a surgical standpoint, it would seem that the principle function of the appendix is to get inflamed and cause peri-typhlitic abscess.

PATHOLOGY.

The chief interest in the pathology of appendicitis lies in the relation existing between disease of the appendix and pericæcal inflammation and abscess; a relation which, in many cases, is very intimate and easily demonstrated. Pathologically as well as anatomically, the appendix is part of the cæcum; its structures are continuous, and inflammation or other morbid process may extend from one to the other, and yet as a matter of experience, it is generally found that the appendix may be the seat of inflammation, even perforation or gangrene, while the cæcum remains unaffected, or at the most is only affected

secondarily. As to the cause of appendicitis, it appears to be always traumatic, or at least the inflammation and ulceration is due to the presence of retained secretions, or of a concretion which acts as a foreign body, oftentimes the inflammation being excited by a blow or unusual physical effort. I repeat that irritation, inflammation, and perforation of the appendix is most frequently, if not invariably, caused by the presence of foreign bodies in the canal of the organ. Such substances are usually phosphatic, or fecal concretions or small objects aggregated which have gained entrance, or the ordinary secretions of the canal may be condensed into concretions made up of epithelial or other constituents. The retention of such material may be caused by stenosis of the cæcal opening, or by thickening of the mucous coat, or by any abrupt change in the position of the appendix which occurs when the organ becomes adherent to the cæcum, so that the outlet of the organ becomes more or less blocked. While it is popularly believed that such concretions are originally foreign bodies, such as grape seeds or cherry pips, this is rarely the case. In the great majority of cases the masses are more or less globular, others are shaped like small date stones, moulded to the interior of the canal, evidently a collection from mucous secretion which deposited phosphate and carbonate of lime upon a nucleus of fæcal origin. As previously intimated, some of the cases are due to occlusion of the canal, and are attributable to retained secretion. Many undoubted cases have been reported, however, in which foreign bodies, such as pins, needles, oyster shell, small seeds, etc., have entered the appendix from the bowel, and caused perforative appendicitis.

In default of a more satisfactory classification of cases of inflammation of the appendix and its results, I feel justified, after considerable experience, in recognizing three varieties or groups of the affection.

First group.—*Irritation or inflammation.* Cases of simple irritation or inflammation of the appendix during the first attack, cannot be positively recognized, but the recurrence of such an attack, establishes a strong probability of this diagnosis.

Every practitioner is familiar with ordinary appendicitis; the symptoms are quite characteristic; the disease is not infrequent and is generally soon recovered from. Recurring attacks also are very common, the intervals being variable, from a few weeks to several months, or, as in some cases, years may intervene. If the cause has been due to some irritating foreign body, and the organ has been able to discharge its contents into the cæcum, a permanent recovery may result, but such favorable termination rarely occurs. If the disease arose from retained secretions, which have been gotten rid of, atrophy of the appendix

² Prof. Leidy, under date of February 27, 1891, in a note to me says: "I have observed the appendix varying from about three to nearly six inches in length, but have never seen such a case in which it was absent. In the infant it appears to be less abruptly in extension of the cæcum, that is to say, from the subsequent greater proportionate enlargement of the latter, the appendix becomes a more abrupt extension."

³ Dr. Toft of Copenhagen, who, while prosecutor to the Royal Frederiks Hospital, found residua of appendicitis in the form of adhesions in 35 per cent. of all post-mortem examinations made.

may follow on the subsidence of the inflammation and the organ become a cord-like body, no longer liable to internal disturbance. If the appendicitis be due to minute solid bodies, attack after attack is likely to occur, and as these increase in size, the probability of ulceration of the mucous membrane from pressure is likely to increase as time goes on.

Second Group:—Inflammation, ulceration, or perforation. Any case of mild appendicitis belonging to the first group of cases may pass to the second. As a result of attacks of appendicitis of a more or less severe type, lymph exudation is thrown out, not only about the appendix, but upon and around the neighboring structures. If upon the intestines, such exudation may occasion bowel paralysis, or bands of lymph may involve the intestine subsequently in absolute destruction. So, likewise, lymph may be exuded in sufficient amount in all directions on the peritoneal surfaces, and form a barrier more or less complete, sufficient to protect the general peritoneal cavity from septic contamination, when abscess forms in the pericæcal region. In other cases the exudation forms a distinct abscess wall completely encysting the appendix, and constitutes the distinct tumor, so often observed in such cases; it is usually well defined, immovable, more or less dense, and painful to pressure. Although it may contain pus, as a result of perforation of the appendix, there is no fluctuation until the tumor increases in size; as it approaches the surface, the superimposed tissues become cedematous. Such abscesses may open through the abdominal wall, and so establish a fistula between the bowel, the abscess cavity and the external abdominal surface, or at any other point where the abscess should tend.

This lymph exudation which surrounds the appendix when ulceration and perforation is imminent, may appear very quickly; the results of perforation are thus emptied into the lymph mass, and are held absolutely encysted. As the pus increases in the interior of the tumor, the exudation of lymph may increase, or the wall of the abscess may become thinner, and so the abscess may burst into the peritoneal cavity, or into the superimposed cellular tissue. The formation of pus due to a perforated appendix is announced by most characteristic symptoms if the pus come in contact with the peritoneum; but when the appendix perforates into a lymph tumor, the peritoneum is guarded, and the symptoms of pus formation are not so marked; indeed there are frequently no symptoms whatever which would indicate such an accident.

Third Group:—Ulceration and Perforation, with insufficient lymph protective walls.

Many of the reported cases belong to this class. The symptoms appear suddenly, and present

the gravest characters. Now, and then especially in children, the disease advances with intense rapidity, the patient early entering a condition bordering on collapse; such cases I have seen terminate fatally in forty-eight hours, or even less time. Careful inquiry revealed in every case, the fact of a former attack of appendicitis. In such cases when perforation happens, there is either no lymph protection to the peritoneum when the accident occurs, or else the exudation has been insufficient, so that when sloughing or perforation takes place, the contents of the appendix and the sloughing tissue are at once brought into contact with the general peritoneum. Such cases are early associated with symptoms of unusual depression, and often profound collapse.

DIAGNOSIS.

*First Group of Cases:—*Pain is usually the earliest and most common symptom of appendicitis. It may come on suddenly or the reverse, be slight, resembling colic, or severe in character; it is usually increased by pressure. There may be nausea and vomiting, and a coated tongue and constipation are commonly present. There is generally some acceleration of pulse, and a slightly elevated temperature. The ileo cæcal region is generally tympanitic. Sooner or later all these symptoms may disappear and convalescence apparently be established. As I have in former papers pointed out, the occurrence of symptoms such as above detailed, especially if there has been a relapse or recurrence, are serious enough to give rise to grave apprehensions for the future, for in a patient with a diseased appendix, a blow, slight local injury, undue exercise, straining, constipation, or even an attack of indigestion, may provoke a recurrence of irritation in the already diseased organ which may lead to inflammation, ulceration, and perforation. Such cases as I have detailed, which do not proceed to ulceration and perforation, are of very common occurrence; under appropriate treatment they go on to apparent recovery. I believe, however, in all cases of pericæcal irritation or inflammation (or, at least, in by far the great majority of such), the appendix is the source of, and responsible for this condition; the danger is therefore not overcome by the subsidence of the symptoms even if such are ever so mild. The subject of such an attack or attacks, may recover by discharge of the contents of the appendix into the cæcum; or through atrophy of the organ or adhesion to the cæcum with more or less complete obliteration of its calibre. But such a favorable result must be very exceptional, and its occurrence in any given case cannot be depended upon.

*Second Group:—*Incident to the inflammation, consequent upon repeated attacks of appendicitis, adhesions may take place, which involve not on-

ly the adjacent intestine, which may cause more or less obstruction, but as a result of such attacks, lymph exudation takes place, often in large amount, which may completely envelop the appendix.

It is this exudation which forms the tumor in such cases, so that when perforation occurs, the pus does not gain access to the general abdominal cavity, but remains encysted; if this protection did not frequently exist, perforated appendicitis would be a much more fatal affection. This tumor wall is often quite dense and thick; when its contents increase the sac distends proportionately, or if more or less thin, the abscess may open and discharge its contents, either into the peritoneal cavity or into the superimposed tissues and reach the surface, or in some cases, by attachment and perforation, be emptied into intestine, bladder, or other organ. Such abscesses are far less serious than those which are found in the third group, where the appendix has no enclosing lymph wall. In the former, or second group, although as already stated, pus has formed, it is completely encysted in a tumor, similar to such formations in the ovary or tube, with no special early symptoms necessarily indicating pus formation.

Third Group.—When in addition to the symptoms of appendicitis, those of a far graver nature appear suddenly, viz.; intense local, afterwards general, abdominal pain, marked tympanites, a fluctuating temperature, reaching 102° or even higher, with slight or decided rigors, moderate or profuse sweatings and prostration, there can be no question of the advent of acute perforation and abscess formation in close contiguity to peritoneal surfaces. In such cases where the patient, who has been apparently in perfect health, is suddenly stricken with such grave symptoms, indicating perforation—and I have seen a number of such—careful questioning always reveals the fact that the patient has had one or more attacks of appendicitis, but often so trivial as to be almost forgotten. The history of the former attacks, however slight, therefore, would clear the way for establishing a positive diagnosis.

Although it may be possible for inflammation and abscess to occur quite independent of the appendix in the pericæcal region, yet such instances must be exceedingly unusual. Several years ago (in 1886), I opened a supposed uncomplicated pericæcal abscess of large size; apparently there was no communication with the appendix or cæcum, the walls of the abscess seemed to involve only the connective tissues. The patient recovered, but subsequently suffered from attacks of pain in the same locality, which were then judged to be from a diseased appendix; suddenly, and nearly two years afterwards, the symptoms of perforative appendicitis and peritonitis appeared; there was no tumor, the ileo cæcal region

being markedly tympanitic; section was promptly made, which discovered an abscess and commencing general peritonitis. The lymph exudation was recent, the original abscess walls had been absorbed, so that there was no protection to the general abdominal cavity. The appendix was found enormously enlarged and perforated; it was excised, and the patient has since married and has continued in perfect health. Had the second abscess not formed, the case would have been judged to be a simple pericæcal abscess. While there is every reason to believe that all acute abscesses in the appendix region are due to some lesion of this organ, there is no special reason for the occurrence of simple typhlitic abscess.

I repeat, that it is very doubtful if those cases of perityphlitic inflammation, which under appropriate treatment, go on to convalescence, are cases of inflammation purely of the walls of the cæcum, and connective tissue; such a condition possibly may occur, but it is more probable that in every case the irritation arises in the appendix, with more or less a local peritoneal inflammation. Then again, in every case in which I have excised the appendix for perforative inflammation, there has been a history of former attacks, the symptoms of which corresponded with those which some clinicians describe as indicating typhlitis. In order to determine the presence of an abscess cavity in the ileo-cæcal region, if the symptoms detailed would not be considered sufficient, rectal examination might be made, but I have never been in the slightest degree aided by this procedure.

DIFFERENTIAL DIAGNOSIS.

It, probably, is impossible to differentiate disease of the cæcum from appendicitis at an early state of the malady, as their relations are so close and they both give rise to similar local disturbance. Both organs are covered by peritoneum through a variable portion of their extent; both are liable to irritation, inflammation and perforation.

Perforation of the appendix is a very common accident, while the reverse is true with regard to the cæcum. Even in those cases where cæcal perforation has occurred, it is most likely the result of previous appendix perforation or disease.

One such case occurred in Pennsylvania, under the care of Drs. Rich and Sailor Brown, of Williamsport. I saw the patient in consultation. On the second day after the removal of the gangrenous appendix, fæces came from the wound, and upon careful inspection, two gangrenous perforations were found involving the cæcum. At the time of the appendix removal, the cæcum and colon were markedly impacted and discolored; the violent inflammation about the appendix had extended to and involved the intestine. The resulting gangrene was due in part to con-

tiguous inflammation and in part to impaction. But if this abscess cavity had been simply opened and the appendix not reached, the subsequent appearance of fæces would apparently have established the diagnosis of simple cæcal perforation, while the lesion of the appendix would have been overlooked.

The history of previous attacks of pain in any given case would establish the diagnosis between perforative cæcitis and perforative appendicitis in favor of the latter; at any rate, the necessity for operation being the same in both, the final diagnosis can be left until section has been made.

From Acute Intestinal Obstruction:—The symptoms in intestinal obstruction advance very rapidly, even more so than in appendicitis. In volvulus there is usually more severe pain, which is referred to the umbilicus. Intussusception is accompanied by frequent desire to stool and discharges of mucus and blood; an examination by rectum will probably establish the diagnosis, which also can be said of impaction. Finally, obstruction may be simulated by the attending peritonitis owing to the paralyzing effect on the bowels.

Strangulation of the bowels, intussusception, peritonitis, volvulus, generally come on very suddenly. Impaction of fæces, psoas or iliac abscesses or tumors, come on gradually. Cæcitis and perforative ulcer of the cæcum are also more or less rapid in their course, and point superficially more quickly than does the abscess to which appendicitis gives rise.

From Spinal or Perinephritic Abscess:—Attention to the history of the case and to the local signs of the disorder will enable us to diagnose these forms of abscess. The treatment being almost identical, at least as far as laparotomy is concerned, we need not waste time in making refinements of diagnosis, although the differential diagnosis can generally be made.

In psoas abscess difficulty may be experienced at times in differentiating it from pericæcal inflammation. But in the former there is generally dorsal pain and gastric irritation, and a history of long continued ill-health. Abscess from Potts' disease generally points to the groin, either just above or below Poupart's ligament. It also is associated with ill-health and difficulty in walking. In abscess of the right ovary and tube, the history and digital examination of the case would usually establish the diagnosis. An abnormal pouch or diverticulum of the ilium occasionally is found in the right iliac region, and might complicate the diagnosis, which could only be cleared up after section.

Tumors, both malignant and non-malignant, may be found in this region, but as a rule little difficulty need be experienced in clearing up any doubt. Their physical characters and clinical history are usually sufficient.

When pericæcal abscess points in an anomalous situation, all available diagnostic skill will be required to affect a diagnosis. Unlooked-for complications also may arise, which the surgeon must expect, and which he must always be prepared for. Some of the difficulties which occasionally confront us in making a diagnosis are well illustrated in the following cases:

APPENDICITIS; LATERAL SECTION; OPERATION COMPLICATED BY AN ENLARGED, ELONGATED GALL BLADDER; APPENDIX AMPUTATED, AND THE STUMP INVERTED INTO THE CÆCAL CAVITY. RECOVERY.

Mrs. E. S., aged 46, came under my care January 5, 1891, with symptoms of appendicitis which had existed for a week. Pain had been a prominent symptom, with elevation of temperature, abdominal distention, constipation, furred tongue, and persistent vomiting. Directly over the ileo-cæcal region there was a tumor which was slightly movable and exceedingly painful upon pressure. There had been no previous attack of pain in this region, no chill and no sweating. The symptoms pointed to irritation or inflammation of the appendix or pericæcal region, but not to abscess; but the presence of the tumor was very puzzling, and its character could not be made out. These were the symptoms indicating a first attack of mild appendicitis, and yet a large circumscribed tumor, painful to pressure, was likewise present; but the fact that this tumor was somewhat movable led to the view that it could not be connected with the appendix; at all events, it seemed proper to open the abdominal cavity, explore it, and examine the appendix, and then to be guided by circumstances.

A lateral section was made on the eighth day. Upon entering the abdominal cavity, the tumor proved to be an immensely elongated and distended gall-bladder, which was about five inches in length, lying directly above the appendix region, and in size and shape resembling a small banana. A careful examination of the liver failed to show the presence of any gall stones. The appendix was found greatly thickened, but free from adhesions. It had an extensive mesentery, which was ligatured and removed with the appendix. The stump of the latter was inverted and invaginated into the cæcal cavity. The peritoneum was then brought over the inverted tissues by five sutures. The wound was closed with deep and superficial interrupted sutures. Drainage was not used.

An excellent recovery followed, and the gall bladder has apparently resumed its normal size.

Dr. Morris Longstreth, who examined the appendix, reports: "Great hypertrophy and thickening, especially of the mucous coat, and ulceration in two places, which appeared to correspond with the enlarged solitary follicles."

GANGRENE OF THE APPENDIX VERMIFORMIS,
WITH NECROSIS OF MESENTERY AND ILIUM;
PERICÆCAL ABSCESS WITHOUT SPECIAL
SYMPTOMS. LAPAROTOMY. DEATH.

On Tuesday, March 6, 1890, in response to a telegram from Dr. Phillips, of Trenton, N. J., Dr. DaCosta and I visited a patient with him in consultation. The message stated that the case was one of volvulus, and requested me to come prepared to perform laparotomy. The patient, who was about 42 years of age, had been apparently in robust health, had remained indoors on the preceding Saturday. He had been constipated, for which a laxative had been given, but no relief was obtained. All efforts during the succeeding four days to procure an opening of the bowels signally failed. During this period there was no special symptoms except nausea, and occasional vomiting. After a careful and thorough examination, we were unanimous in the opinion that a positive diagnosis could not be made at that time. It was stated that there had been little if any pain in the abdomen, which was not abnormally distended; the temperature had been normal; there had been no chills or rigors; no acceleration of pulse; the principal symptom being simply a refusal of the bowel to respond to cathartics and enemata. There seemed to be more of a bowel paralysis rather than obstruction from twist or invagination. There was no symptom of peritonitis or other grave lesion of any of the abdominal contents. On inquiry, it was stated positively that there had never been any previous attack of pain in the appendix region. After a most careful consideration of the case, we were unanimously of the opinion that the idea of an operation could not at that time be entertained, and was not justifiable, but agreed that calomel should be administered in fractional doses, $\frac{1}{10}$ of a grain every half hour, with an occasional dose of podophylan, and as much nourishment as possible.

On separating it was understood that we should hear, promptly, if there was any unfavorable change. Early the next morning Dr. Phillips telegraphed: "Treatment agreed upon yesterday has been carried out; general distress and distention increasing; strength is less, temperature subnormal. I think, as does the patient, that the operation should not be deferred." Upon my second visit, I found the patient with marked hicough, and an irregular feeble pulse with slight abdominal tension, and no marked pain. There had been no movement of the bowels. The belief that some grave lesion existed, was warranted by the prostration, the subnormal temperature, the weak pulse and the loss of strength, but there was no evidence of peritonitis, local or general. In other words, the symptoms were negative, and it was impossible to clear up the diagnosis even at this time. Al-

though the patient was in an exceedingly grave condition, I quite agreed with Dr. Phillips that an exploratory operation was justifiable. Ether was administered, a two inch incision was made in the median line, and an exploration was made with the finger. To the left of the umbilicus, and extending from just above to just below its level, was a mass of collapsed intestines, but nothing abnormal was found, except slight distention, in any portion of the abdomen until the exploring finger was carried deeply into the right iliac fossa, where it plunged into a very foul abscess, and pus flowed freely from the wound. The incision was then considerably enlarged. In this cavity was found an enormous appendix vermiformis, inflamed and gangrenous in places which was ligated and cut off. The boundaries of the pus cavity comprised the under surface of the cæcum and ascending colon, iliac fossa, mesentery and portions of the small intestine. The portion of the wall made up of mesentery, was necrotic for quite a distance at or very near its root, and the ilium was covered with lymph, and for some inches showed structural change. The sloughing portions separated as soon as touched and bled vigorously. The bleeding vessels were taken up by ligatures, in part individually, and in part *en masse*. Evisceration had been necessary to get at and tie off the appendix. The intestines were now, with some difficulty, returned and the abdominal cavity thoroughly washed out. A glass drain was carried deeply into the pelvis, and the parietal wound sutured.

It was expected that extensive necrosis of the intestine would occur, if it had not already started, because of the condition of the mesentery. No other operative resource seemed possible in this most desperate case.

The presence of such serious disease was a matter of profound surprise, and was totally unexpected, for none of the symptoms pointed to the existence of such a complication, and the diseased conditions could not possibly have been diagnosed by the symptoms. It is most extraordinary that such destructive changes could have existed without symptoms indicating such lesions, and I know of no instance, in my experience, where such disease existed without equally positive symptoms. The only symptoms which heralded the grave condition, subsequent to the visit of Dr. DaCosta and myself, were those already alluded to, viz.; the hicough, irregular pulse, sub-normal temperature and failure of strength.

Subsequent to the operation there was a marked improvement in every respect; this was due to the removal of the purulent matter, and foul contents of the abscess cavity, while the fatal result which took place two days subsequently was due to exhaustion incident to the gangrene.

The question was raised at the time, whether or not, if the operation had been performed on the day Dr. DaCosta and I saw the patient, the result would have been different. To this I replied, that after the most careful consideration it was agreed that the safest course was to wait; that the diagnosis of volvulus and intussusception was abandoned, as well as peritonitis; of the latter, indeed, there was not a symptom present. Indeed, had laparotomy been performed twenty-four hours earlier we would have found almost precisely the same fatal conditions, for such extensive disorganization is of slow and not so rapid growth. Dr. DaCosta, having read this report, has written: "I have read the above and concur entirely; no earlier operation could have had a different result."

In reviewing the history of this case, I am at a loss to be able to see in what way a diagnosis of such a condition could be made; for it seems almost impossible that with inflammation, abscess, obstruction of the bowels, from lymph and gangrene, there should not have been some positive symptoms. On making further inquiries subsequent to the operation, it was stated by a member of the patient's family, that about two years before, the patient had a serious but brief attack of pain in the appendix region, which was not relieved until after the administration of a hypodermic of morphia; so that, unquestionably, the appendix had during this time been diseased, and was the cause of the fatal attack. Had the fact of a previous attack of pain in the ilio-cæcal region been known prior to the operation, it would have been sufficient to elect a lateral instead of a median section, but at the time we were called to the case, it would not have made any difference in the ultimate result.

PROBABLE PERFORATIVE APPENDICITIS; ABDOMINAL TUMOR SUPPOSED TO BE MALIGNANT; EXPLORATIVE LAPAROTOMY; DIAGNOSIS OF MALIGNANT DISEASE RE AFFIRMED; SUBSEQUENT DISCHARGE OF AN ABSCESS INTO THE URINARY BLADDER; CLOSURE OF FISTULA. RECOVERY.

On the 23d of last June, Mr. T. H. W., aged 33, from North Carolina, came under my care, as a private patient, in the Orthopædic Hospital, with the following history.

About six months previously, or just before Christmas, in 1889, he first had pain in the lower abdominal region; more frequently at night, and was very constipated. The pain lasted about ten days, then gradually subsided, and during this time he was obliged to lean forward in walking, owing to a sense of drawing. About the 25th of April following, when in Scranton, Pa., after feeling poorly all day, he experienced a very severe attack of pain in the lower abdominal region, which lasted for many hours, and was only

relieved temporarily by opium and hot applications. Two days later, although very weak, he went South. On the journey he had a very severe chill, which was followed by fever and pain, the latter continuing all the time; his temperature ranging from 100° to 101° ; at the end of ten days he was compelled to go to bed, blisters were applied on account of pain. A hardness and swelling now appeared somewhat to the right of the median line, but below the umbilicus. The diagnosis of local peritonitis was then made; mercurial ointment was applied (which subsequently caused salivation), and low diet ordered. His temperature ranged from 96° to 102° . His condition finally became so alarming that he concluded to come North. On the way up, he consulted Dr. Hunter McGuire, at Richmond, Va., who suspected an abscess and suggested the use of the exploring needle. This was declined, and he reached Philadelphia on June 16th. He was admitted to the Pennsylvania Hospital under the care of Dr. Ashhurst, who diagnosticated carcinoma of the omentum and bowel. After remaining a week in that institution, he placed himself under my care, as a private patient, and entered the Orthopædic Hospital.

At this time I found him emaciated, with great loss of strength, a temperature not much above 100° , but fluctuating. On examination I found marked hardness of the tissues in the anterior belly wall, a considerable tumor which extended from just below the umbilicus to the bladder region, situated over the right iliac region, but not completely. The tumor was hard, more or less irregular, and painful to deep pressure.

The history of the case was that of local peritonitis, and the symptoms pointed to deep abscess, yet as the more marked hardness and tumefaction was confined to the central abdominal region, the question as to the appendix being the source of the trouble was held in abeyance. Hot fomentations were applied, and large amount of milk, nutritious foods and stimulants were ordered.

A few days later I left the city for a trip to the Pacific Coast. During my absence the patient had another acute attack of pain, with marked fever; the only comfortable position he could secure was with the knees drawn up and his body bent forward. Dr. Agnew was called in, who confirmed the diagnosis of malignant disease. After a residence of three weeks in the hospital the patient went to Scranton, and was under Dr. Logan's charge. He subsequently got very weak, his temperature ran high, his pain was severe, and there was progressive loss of flesh. On August, 3 Dr. Mordecai Price visited the patient at his home, and an exploratory abdominal incision was made; the intestines and omentum, it is stated, were found matted together by what was pronounced to be carcinoma, and the opinion

was given that he would probably not live through the month. For a week the patient was in a bad condition, chiefly due to obstinate constipation, high temperature, severe pain. Three days after the operation he passed per urethram, what seemed like the "stem of a water lily," of a reddish black color (probably a blood clot). He had great burning at the end of micturition, and the urine had a foul odor and contained pus. At times, subsequently, the amount of pus was one-third of the urine passed; gradually the pus disappeared and the urine apparently became normal, of natural odor and color, and would so continue for periods varying from five days to two weeks, the latter being the longest interval. It was very noticeable that when the pus was not discharged from the bladder the patient's temperature increased and general symptoms were less favorable. He frequently passed in the urine, masses of brownish or slate colored tissues in a state of decomposition. This continued right along until early in December, although he gained some 15 pounds in weight, when I visited him at his home in Glenburg, near Scranton. He was then in bed and passing large amounts of pus with the urine; and then, for the first time, considerable gas escaped by the urethra, specially at the close of urination. On further examination, I found that subsequent to the exploratory laparotomy and the discharge of pus, that the tumor or hardness of the abdominal wall gradually lessened, and finally disappeared, with the exception of a slight hardness which led from the bladder region to the right iliac region. A careful survey convinced me that the patient was the subject of a fistula which had extended from the appendix, that this organ had been originally inflamed, had become surrounded by lymph, had subsequently perforated when abscess formed, that the adhesions had taken place with the abdominal wall, and finally the pus track led on to the bladder, into which an opening took place, through which the abscess contents, pus, foreign matters, and gas were discharged. The patient was placed on milk, with directions to increase the amount to three quarts daily, also extract of malt and as much nutritious food as could be digested. When his condition warranted, I advised that he should come to Philadelphia for a section and removal of the appendix. His condition after this improved rapidly, no further abscess appearing. He came again to the Orthopedic Hospital on December 27. From that time, however, he improved rapidly, gaining nearly a pound a day, and was soon able to walk. The hospital record states: "The abdomen neither scaphoid or prominent; below the matrix of operation and towards the pubes there was some slight but deep induration, but no tenderness." Urine was examined and found to be normal. It seemed reasonable that with the im-

provement of health the fistulous track might have closed naturally, so that on January 12, after a short residence in the hospital he was discharged apparently cured, with the understanding that should any further evidence of the trouble appear, the source of it should be investigated and eliminated by abdominal section. He is at this time apparently quite well.

The following case illustrates the grave danger which arises from bands of lymph adhesion, which are liable to be thrown around the appendix as a result of repeated attacks of appendicitis. Such adhesions may prevent the surgeon, at the time of the operation, finding the perforated organ, which not being removed, is likely to give rise to fæcal fistula; and I have seen several such cases.

PERICÆCAL ABSCESS; LAPAROTOMY; ADHESIONS; APPENDIX NOT DISCOVERED; RECOVERY WITH FÆCAL FISTULA; FIVE MONTHS LATER ABDOMEN RE-OPENED, FISTULA FOUND AND CLOSED; RECOVERY.

George I., aged 30, a patient of Dr. Benj. F. Butcher, of Philadelphia, was admitted into the Pennsylvania Hospital, May 12, 1890, in an exceedingly prostrated condition, with a history of former attacks of pericæcal inflammation, the last being followed by symptoms indicating perforation of the appendix and abscess.

The attack came on suddenly, with pain in the appendix region, which was greatly increased by pressure; there was nausea, fever and constipation; later on there was a sudden accession of intense pain with deep swelling, and general abdomen tenderness and tympany; a fluctuating temperature, chills and profuse sweatings. The skin over the ileo-cæcal region became discolored, somewhat œdematous, but no distinct tumor could at any time be felt, yet there was some hardness of the deep tissues.

Such was the condition in May, 1890. A lateral incision was made directly over the region of the appendix, which exposed a large abscess cavity containing fœtid pus; careful search failed to discover the appendix, but the surroundings were so matted together by adhesions that further exploration was not deemed prudent. It was supposed that the entire appendix had sloughed from the violence of the inflammation, which had doubtless resulted in gangrene of the entire organ.

The abscess and abdominal cavity were thoroughly washed, and two drain tubes were inserted, one of glass to the bottom of the abdominal cavity, the other a rubber tube into the most dependent part of the abscess cavity. A rapid recovery followed, but a fistulous opening remained which now and then discharged excrementitious matter, showing that an opening existed into the intestine, which was probably at site of appendix.

In October, I made a second section, for the purpose of closing the fistula. The incision was made directly in line with that of the first operation; on reaching the cæcum it was found that all the adhesions which were present at the first operation had been absolutely and completely removed. The cæcum was now readily manipulated, and it was found open, as supposed, at the site of the appendix, which had unquestionably sloughed off; the fistula was of sufficient size to admit the end of the little finger. This was closed with nine Lembert sutures; recovery was rapid and perfect.

As a result of repeated attacks of appendicitis extensive adhesions may surround the intestines also and cause fatal obstruction, as illustrated in the following cases:

PERICÆCAL ABSCESS. OPERATION REFUSED.
PLASTIC PERITONITIS. DEATH.

In the spring of 1890 I saw, in consultation with Dr. Trautman, of Philadelphia, a young man of 28 years of age, who had been confined to bed for a week, with all the symptoms of violent appendicitis. There was no defined tumor, but indistinct local hardness and general tumefaction. Temperature slightly raised; there was constipation, and pain, which was marked, was increased on pressure. There was also a history of several, perhaps three, former attacks, but not so severe as this one. I advised a lateral section and removal of the appendix, which sooner or later, I judged, would perforate and probably excite general peritonitis. The patient declined the operation. He subsequently had two attacks, in May and July.

Early in the following fall, the patient sought admission into the German Hospital. It appears that he was then suffering from another attack similar to the one in which I saw him. The trouble was at first supposed to be a retro-peritoneal sarcoma; then it was taken to be chronic peritonitis. He died of exhaustion, with symptoms of obstruction. The autopsy revealed an extensive, adhesive, or plastic peritonitis. The intestines, stomach, liver, spleen and bladder were so united as to form one huge mass, which, when loosed along the vertebral column, was lifted out entire; the appendix, which was undoubtedly the source of the trouble, was found firmly adherent to neighboring loops of intestine, with much inflammatory tissue.

The following case occurred very recently:

OBSTRUCTION OF THE BOWELS, PERSISTENT VOMITING. PURULENT PERITONITIS; SECTION; EXTENSIVE ADHESIONS FROM PREVIOUS ATTACKS OF APPENDICITIS; GANGRENE WITHOUT PERFORATION OF THE APPENDIX; DEATH ON THIRD DAY.

Mr. J. E., 32 years of age, living in Philadelphia, on January 21, 1891, was awakened early in

the morning by violent pain in the abdomen, referred to umbilicus and right inguinal region, with persistent vomiting. Bowels constipated, but had a small passage on the 20th. He had a similar attack last October, while away on a hunting trip, by which he was confined to bed for seven days. He then returned to his home, and was confined to his bed for some time with similar symptoms, from which he gradually recovered. In December he had another attack. He stated, however, that he occasionally had pain in the appendix region, especially when stepping out of his carriage or when his body was jarred, impressing him with the fact that everything was not right. He had had a similar attack in 1887. I was called in on January 22, by Dr. Woodbury, who had first seen the case the day before and had given him a cathartic and large enemata, without succeeding in evacuating his bowels. (His family medical attendant, Dr. Hetzel, was present, and agreed with us as to the necessity of laparotomy.) The operation was performed the same afternoon, by lateral incision. Pus escaped from the peritoneal cavity, showing commencing general peritonitis. The appendix, which was firmly adherent its entire length to the cæcum, was found with some difficulty. It was gangrenous, and tore while being examined. A ligature was thrown around it near the cæcum, and the very large, swollen organ removed. It was the largest I have ever seen. A glass drainage-tube was introduced deep into the pelvis, and small doses of calomel and soda given to check vomiting and move the bowels. There was so great prostration that further examination of the condition of the intestines could not be made. The pain and other symptoms of peritonitis immediately ceased and did not return, but the bowels could not be made to move. The patient vomited all nourishment, even water, and died exhausted on the evening of the 24th day of January.

The several attacks of peritonitis had resulted in general plastic exudation of the bowels, which caused the fatal obstruction—the final abscess, due to gangrene of the appendix, being only an incident in the final result. The operation should have been performed at an earlier period in the history of the attacks and before the occurrence of the extensive adhesions, when the disease was simply appendicular.

PART II.

TREATMENT AND TECHNIQUE OF OPERATION.

First Group: The treatment of the first group of cases, the irritative, catarrhal, or simple inflammatory disorders of the cæcum and its surrounding, or of the appendix, should consist in absolute rest in bed, the application of hot poultices or fomentations, perhaps local depletion, and possibly the hypodermic exhibition of morphine to control pain. The bowels should be kept open by the administration of calomel, or salines and enemata.

The diet should be restricted to nourishing liquids.

Second Group: In this variety of cases the disease is no longer simply irritative, catarrhal or inflammatory, but there is ulceration, with impending perforation, if the latter has not already occurred. Lymph, as a result of the violence of the disease, has been thrown out, which has either partially or completely enveloped the appendix, or this lymph exudation may have formed a wall sufficient to protect the general abdominal cavity when perforation and abscess have occurred. Perforation means pus and abscess; the diagnosis, therefore, of such a condition calls at once for abdominal section and removal of the appendix.

In a paper which I read more than a year ago, before the College of Physicians of Philadelphia, on inflammation of the vermiform appendix, I stated that "when the abdomen is believed to contain pus, whether intra- or extra-peritoneal, encysted or diffused, the rule of surgical procedure now is to make a section, remove the offending organs or the sloughing tissues of pus, thoroughly cleanse the surroundings and drain." This rule still holds good, and is being constantly followed with the happiest results.

The risks of operation at this time, are much less than those which threaten the patient. Early interference will save most if not all cases, while the danger of operation is slight as compared with that of general abdominal inflammation. The surgeon should never be satisfied in merely opening the abscess, which is simply a result, and not the cause of the trouble; if this only is done, the operation is incomplete, and at any time may have to be repeated.

Third Group: Here we have sudden perforation or sloughing of the appendix; in these cases there is no lymph wall separating the pericæcal surroundings from the general abdominal cavity, or has the appendix been enclosed in lymph exudation—so that when the perforation occurs, the sloughing tissue, pus, and contents of the appendix are at once brought in contact with the general peritoneum.

The symptoms are at once profoundly grave, indicating general peritonitis and early collapse. Immediate section, removal of the appendix and cleansing of the abdominal cavity and contents, is demanded.

It is hardly necessary to say that the usual precaution in regard to cleanliness and rules of strict antisepsis should be observed. Generally, from the very nature of the case, there is but little need for any special preparatory treatment, prior to the operation.

OPERATION.

In my papers on the treatment of pericæcal inflammation, read before the Philadelphia County Medical Society, in December, 1889, and again in January, 1890, before the College of

Physicians, I stated that the line of abdominal incision should be lateral, and not median. The reasons for this statement are very obvious and positive; for, if the median incision be made, the peritoneal cavity would often be needlessly opened, while the cæcum and appendix can not be well reached or dealt with through it. But if the lateral incision is done, it can be made of less size, more circumscribed, and all the necessary manipulations can be made upon the cæcum, appendix, and surrounding parts without necessarily opening the peritoneal cavity. Should the abscess have reached the cavity of the peritoneum, the intestines can just as well be examined and cleansed through a lateral as a median incision. The incision should ordinarily be from three and a half to five or six inches in length. Starting from about an inch or so above the middle of Poupart's ligament, and to the outer side of the right line a semi-lunaris, it should extend upward and outward and directly over the appendix region, and be continued down until peritoneum, cæcum, or pus cavity is reached. The normally placed appendix, as I first pointed out, can always be found immediately under a point two inches distant from the right anterior superior spinous process, on a horizontal line drawn from this process towards the median line of the body. In some cases where the peritoneum is reached, its discoloration shows that it covers a pus cavity; in others, after the peritoneum is opened, not only pus but a lymph tumor enclosing the appendix, is found; this mass must be opened before the organ be dealt with.

Occasionally, when the abscess is cleansed, the appendix will be seen loosely floating, but frequently it is more or less attached to the cæcum, sometimes firmly fastened to it and detached with difficulty. Now and then it has a mesentery of its own, which may extend its entire length; this must first be tied in sections and then cut away: the appendix is then ligatured with catgut, or silk, close to its cæcal attachment and cut off. There is no advantage in invaginating the stump; in most cases, indeed, this treatment would really be impossible on account of the swollen, infiltrated and unyielding condition of the organ. In such cases there is no reason why the ligatured stump should not be allowed to project from the cæcum. The abscess cavity must slowly fill up and close by granulations. If the general peritoneal cavity has not been involved, the abscess walls and surroundings need only be washed out with hot water (or with 1 to 2,000 mercuric solution). If the appendix has sloughed, or even simply is perforated, search should be made for any foreign body, and all sources of further trouble gotten rid of. A glass drain should be placed in the most dependent part and the wound closed with a few stitches. Very commonly, however, the peritoneum is

found invaded by pus, so that the whole abdominal cavity needs to be thoroughly drenched with hot distilled water (105° to 110°). In such a case even greater care should be taken to find any foreign body which may have escaped from the appendix.

When the general cavity has been involved, a glass drain must be carried to the bottom of the pelvis in the hollow of the sacrum, a large rubber drain should also be placed in the superficial or cæcal abscess cavity.

The post-operative treatment is simple; it consists in the hypodermic use of small doses of morphia to relieve pain, while the ordinary rules of abdominal surgery are to be observed. No food need be given, by mouth, for the first twenty-four hours, or even longer. Nutritive enemata of beef tea, with or without whisky, can be administered every three hours with advantage. The bowels should be opened as early as possible, and for this purpose, small doses of calomel, one-sixth or one-tenth of a grain should be given half hourly, with an occasional one-eighth or one-tenth grain dose of podophyllin. When the bowels have acted, they should be kept in a fairly soluble condition by salines; even threatening peritonitis should be met by saline purgation.

The drain tubes may be removed as soon as the discharges are perfectly sweet, and reduced to a minimum. After recovery, the site of operation should, for a time, be supported by a flat, thin buckskin pad, kept in position by a broad band around the body, in order to avoid the occurrence of hernia.

PROPHYLACTIC TREATMENT.

This paper would be very incomplete, and I should not do justice to the subject, if I close my remarks without referring to the mooted question of the removal of the appendix in the interval between acute attacks. In fact, I have long urged, indeed from my first writing on this subject, that recurring attacks of appendicitis should be an absolute indication for the removal of the appendix at this most convenient time. When we remember that the appendix, which has been the subject of former attacks of disease, is liable at any time to be involved in that most dangerous of acute affections, perforation of the organ and pericæcal abscess, and when such a seizure may take place where adequate medical skill cannot be had, it seems much safer to avoid the possibility of future trouble from this source, by getting rid of the appendix when its surroundings are free from active irritation. Objection is made, and very naturally, to such a radical operation as excision of the appendix, especially when the patient is in a favorable condition or has apparently recovered.

If, however, health has become impaired by one or more attacks of mild or serious seizures, and if these attacks have increased in fre-

quency, severity, or duration, the removal of the organ is clearly indicated. The premeditated operation permits the careful preparation of the patient. The incision should be made in the same line as previously described, but it need not be more than three inches in extent. All bleeding points should be ligatured with fine catgut, when the peritoneum is reached, and after the wound is quite free from blood or other fluid, the peritoneum is incised. The omentum or intestine will then present itself in the wound; rarely will the appendix be seen until the bowel is pressed aside to the right with the finger. It may be found partially or entirely attached to the cæcum or elsewhere; if so, the adhesion may be separated by the finger, and divided between double ligatures. The appendix may be quite free from mesentery, or, as I often observed, it may extend throughout its entire length; should this be the case, the meso-appendix is ligatured in portions and then cut through between the ligatures and the appendix; the latter is then cut off near its cæcal origin. If the stump be permitted to remain projecting from the cæcum, free it must be included in a ligature, and its extremity covered by peritoneum.

I originally, in 1889, called attention to the fact that the stump of the appendix could be readily inverted and completely invaginated into the cæcal cavity, hence all danger from it could be gotten rid of. The manipulation consists in grasping the stump with a forceps or probe, and pushing it into the cæcum; the peritoneum is then approximated over the inverted stump by four or five sutures, which retain it in the cæcum, and effectually prevent its subsequent prolapse. This having been accomplished, the peritoneum is then brought together by a row of interrupted deep sutures, and also the external muscle and skin. Drainage could only be required in very exceptional circumstances. The after treatment is simple; the bowels having been well opened before the operation, need not be disturbed for several days; the dressings may go untouched for a week or even longer, when the sutures should be removed.

IN CONCLUSION.

I have thus gone over, somewhat briefly, the subject of this paper, and have also presented some of the difficulties which I have experienced; such difficulties, however, can generally be overcome. The key to the situation is the diagnosis, which should lead the way to prompt surgical treatment; and finally, if I have not presented anything specially new or interesting, I hope at least that the discussion of such an important subject will prove to be not without some practical value.

THE ELECTRICAL TREATMENT OF FIBROID TUMORS.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5-8, 1891.

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The progress of the Apostoli method of treating fibroid tumors of the uterus, presents both analogies and contrasts to those of some of the recent therapeutic claims that have been widely investigated by the medical world. Recognized at last, owing to the persistent agitation of its originator, it was, like the Brown-Séquard and Koch theories, enthusiastically adopted by those pioneer advocates who often* make up for crudeness of training, and inexactness of observation, by a debt of stimulated progress laid upon subsequent workers. In contrast to the theories alluded to, it has since borne the test of capable experiment to an extent that even exceeds the original claims, and with the broadened use of electricity in other allied conditions, has made a new departure in gynecology. Unlike them also, it has encountered an opposition of unparalleled fierceness, an opposition, however, that has been as healthy as it has been fierce. The cause of this unusual attitude towards a new remedy is easily seen in the recent extension of abdominal surgery, and this highly favored disease has, therefore, been treated to a rivalry of methods that cannot be other than productive of the best results. Far from regretting this rivalry, I indeed point to it as an important index of medical development, and cannot but regret that other therapeutic efforts, now blindly accepted, are not subjected to similar tests. I do regret the immoderate statements of certain extreme opponents. Undermined in their wholesale and indiscriminate resort to dangerous operations, by the attention bestowed upon a milder and non-dangerous method of enforced atrophy, they have been invariably the aggressors in controversy, condemning in unmeasured terms a method of which they knew nothing. This is in striking contrast to the position of many electrotherapeutists, who willingly concede to surgery, certain cases unsuited to electrical treatment, yet demanding active help. Experience is alone the final arbiter, and in view of the many cases of symptomatic cure and reduction, and the considerable number of those that have completely disappeared under electrical treatment, now on record, it is in order for those who advocate an exclusively surgical treatment to come forward, not with wet specimens just removed from patients who may die subsequently, or even mere reports of deaths and recoveries from the operation, but with full reports of the ultimate results of each case that withstood the operation of oöphorectomy or hysterectomy.

The profession is not simply interested in the average mortality of these operations for comparatively benign tumors, but wishes to know also the results in the restoration of health and comfort to these patients. For instance, some careful operator should tell us how often removal of the appendages for bleeding myomas fails to control the hæmorrhages; how often this procedure in patients approaching the menopause is followed by mental disturbances; how often a successful hysterectomy is followed by abdominal fistulas, intestinal adhesions, hernias, and other sequelæ that are as troublesome and painful to the patient as the benign tumor itself? Until such statistics are collected there can be no true comparison of surgical and electrical methods, as the latter refers only to results that are always more or less remote from the remedial procedures.

As an illustration of the results of the electrical treatment of these growths, I have arranged in a tabular form the histories of forty-six consecutive cases treated by myself, giving concise statements of the conditions present at the beginning of treatment, the nature of the applications, and the results as ascertained at various periods after the cessation of treatment.

An analysis of this table will show that seven cases should be eliminated from consideration in this paper, because two cases (Nos. 37 and 46), were polypoid, and their delivery was merely assisted by the electrical applications made, and five cases (Nos. 2, 14, 18, 21, 45), were treated for so short a period that it is impossible to use them in demonstration.

The remaining thirty-nine cases had more or less thorough treatment, and in the matter of results attained are divisible into five classes:

Class 1. Cases of complete anatomical and symptomatic cure, the tumor disappearing and the patient being restored to health. Of this class there were five (Nos. 7, 17, 20, 22, 24).

Class 2. Cases in which the tumor was considerably diminished in size and all other symptoms were cured. Of this class there were twenty-three (Nos. 1, 4, 5, 6, 8, 9, 11, 15, 16, 19, 27, 28, 29, 30, 32, 34, 35, 36, 38, 39, 40, 41, 42).

Class 3. Cases in which the tumors were not diminished in size, but all the symptoms were relieved. Of this class there were eight (Nos. 10, 13, 23, 25, 26, 31, 43, 44).

Class 4. Cases in which the tumors were not diminished nor the symptoms relieved. Of this class there were two (Nos. 12, 33).

Class 5. Cases made worse by the treatment. Of this class there was but one (No. 3).

PERCENTAGES.

Based upon the thirty-nine cases of thorough treatment, therefore, it will be seen that 12.8 per cent. resulted in complete cure and disappearance

HISTORY OF FORTY-SIX CASES TREATED BY ELECTRICITY. BY DR. G. BETTON MASSEY.

No. of Case.	Description of Growth.	Age of Patient.	Known Duration of the Growth.	Clinical Symptoms.	Method of Treatment.	Total Duration of Treatment.	Results.	Time after Cessation of Treatment, when results were Verified.
1	Sub-peritoneal, loosely attached hard growth, size of goose-egg, accessible through right vault of vagina.	45	4 years.	Pressure on bladder and menorrhagia.	Buried puncture—60 to 200 ma. four times at intervals of a week.	1 month.	Complete relief of all symptoms and reduction of growth about one-third.	3 years.
2	Intra-mural and sub-periton'1 multilobular growth filling abdomen to four inches above umbilicus.	47	20 years.	General pressure symptoms and impairment of health.	Intra-uterine—100 to 200 ma. eight times daily.	12 days.	Temporary aggravation of the pain due to frequency of treatment; subsequent improvement.	1 year.
3	Sub-mucous, sessile fibro-cyst, enlarging uterus symmetrically to size of 7th month of pregnancy.	49	5 years.	Bloody and watery discharge, pain, and general impairm't of health.	Intra-uterine—and plus 25 to 300 ma. every other day until os dilated and tumor presented.	3 months.	Septicæmia occurred during expulsion of tumor, followed by death on the twelfth day.	
4	Sub-mucous, sessile polyp, of small size. Uterus hypertrophied; cavity four inches.	38	2 years.	Pain and purulent leucorrhœa.	Intra-uterine—and plus 40 to 150 ma. ten applications.	3½ months.	Relief of symptoms, reduction of tumor to a nodule, and of uterus to normal size.	
5	Intra-mural, multinodular growth, filling abdomen and extending two inches above umbilicus.	38	2 years (?)	Profuse and hastened periods; severe pain and difficult locomotion.	Intra-uterine plus and — 65 to 150 ma., at intervals of week or more.	4½ months.	Symptomatic cure, restoration of menses to normal, and reduction of growth to two inches below umbilicus (about one-third).	1¾ years.
6	Sub-peritoneal and intra-mural multinodular growth, extremely hard, filling pelvis and lower third of abdomen.	41	12 years.	Constant pain, aggravated at periods which were of two-week type and profuse. Offensive purulent leucorrhœa.	Intra-uterine, 60 to 200 ma.—twice weekly; later, once weekly.	9 months.	Arrest of all pain and discharge; reduction of tumor about one-fourth, and restoration of periods to 28-day type.	2 years.
7	Intra-mural growth, filling pelvis, with sub-peritoneal projection reaching the crest of the ilium.	34	9 months.	Constant pain in left groin, and on walking, with profuse purulent leucorrhœa.	Intra-uterine—50 to 150 ma. twice a week.	8 months.	Disappearance of tumor and of all symptoms, and reduction of uterus to normal size. Bands of adhesion left.	1 year.
8	Intra-mural, symmetrical fibroid of large size, wedged in pelvis, and extending to umbilicus.	40	1½ years.	Severe pain, inflammatory attacks, pressure symptoms and impairment of health.	Intra-uterine—80 to 250 ma. every other day, and later every fourth day.	5 months.	Quick release upward into the abdomen, with improvement of health; subsequent reduction to two inches below umbilicus (½).	2¼ years.
9	Intra-mural nodule, 2 inches in diameter in posterior wall of retroflexed uterus.	42	1 year.	Pain and other pressure symptoms, with menorrhagia and profuse purulent leucorrhœa.	Intra-uterine—50 to 125 ma. twice weekly, with intervals of non-attendance.	4 months.	Symptomatic relief and considerable shrinkage.	3 months.
10	Intra-mural growth, size of small orange, in retroverted uterus.	33	2 months.	Flooding two weeks at each period, with constant pressure symptoms.	Intra-uterine plus 25 to 100 ma. twice a week, with intervals of non-attendance.	8 months.	Menstruation regular, lasting five days. Pressure symptoms relieved; no note of change of size.	
11	Intra-mural growth, size of fist, in right side of fundus; cervix elongated; syphilitic history.	30	1 year.	Hæmorrhages at periods which are irregular and frequent; profuse leucorrh. and painful locomotion.	Intra-uterine plus 35 to 100 ma. once a week, with intervals of non-attendance.	6 months.	Menstruation regular and painless; relief of pain and slight reduction in size.	3 months.
12	Two sub-peritoneal pediculated growths, sizes of large orange and lemon, separately attached.	36	1 year.	No Symptoms.	Intra-uterine, 30 to 50	3 months.	No change	
13	Sub-mucous fibroid, size of large adult head, attached by broad base. Os admitting two fingers; growth rapid.	48	6 years.	Continuous hæmorrhages, with pain and impairment of health.	Intra-uterine plus and — 70 to 250 ma. every third day.	2 months.	Arrest of bleeding and menstruation for 3 months. Subsequent history unknown.	
14	Intra-mural fibroid, size of small lemon, in anterior wall. Perimetritic adhesions.	25	2 years.	Irritable bladder, pain in back and difficult locomotion.	Intra-uterine—35 to 50 ma. twice a week.	1 month.	Relief of symptoms; no record of change in size.	
15	Intra-mural, size of lemon, in posterior wall of retroflexed uterus. Tumor in Douglas' pouch.	40	3 years.	Severe pain, pressure, profuse bleeding, menorrhagia and profuse leucorrhœa. Menstrual type, 21 days.	Intra-uterine plus 50 to 125, twice a week.	2½ months.	Arrest of hæmorrhage, restoration of menses to 28-day type, and slight reduction in size.	1 month.
16	Intra-mural growth filling pelvis. Uterus retroverted. Syphilitic history.	28	3 years.	Hæmorrhagic periods and constant pain.	Buried puncture—200 ma. three times, and intra-uterine plus 50 to 100 ma. once a week.	6 months.	Relief of pain, regulation of menstruation, and considerable reduction in size.	6 months.
17	Intra-mural growth, filling pelvis and extending above level of upper spines of ilium.	34	2 years.	Profuse hæmorrhage and impairment of health.	Intra-uterine plus 60 to 110 ma. twice a week.	2 months.	Total disappearance of tumor. Uterus normal in size. Hæmorrhage arrested. Menstruation normal.	3 months.
18	Intra-mural growth, the size of an orange, in anterior wall.	23	Unknown.	Excessive menorrhagia and anticipated periods. Very tender in hypogastrium.	Intra-uterine plus and — 30 to 70 ma. once per week.	1 month.	No record. Case lost sight of	

19	Sub-peritoneal nodular growth, filling abdomen and extended to ribs. Treatment confined to a nodule in Douglas' pouch.	50	14 years.	Pressure symptoms, affecting rectum and bladder especially.	Puncture plus and — 50 to 100 ma. to depth of half an inch, six times.	1 month	Nodule in Douglas' pouch smaller and flatter. Pressure symptoms lessened and bowels move more freely.
20	Intra-mural enlargement of fundus of uterus to a size that fills the pelvis. Multinuclear, firmly adherent. Cavity, 3½ in.	30	6 years	Hæmorrhagic periods, twenty-one day type, with menorrhagia and tenderness.	Intra-uterine plus 60, followed by neg. vag. 40. The first treatment caused prolonged hæmorrhage and pain.	1 month with interval.	No sign of tumor except lumps in tubal region. Uterus normal in size and movable; no pain. Periods regular.
21	Intra-mural, globular fibroid, size large cocoanut, in posterior wall. Cavity, 4 in.	40	2 mos. (?)	Constant hæmorrhage and pain. Bladder irritable.	Intra-uterine plus 30, four times.	1 week.	Disappearance of pain.
22	Intra-mural growth, size of goose egg, in left wall, extending above level of true pelvis.	40	1 year.	Pain, fever, irritability of bladder, and irregular menstruation.	Intra-uterine plus 30 to 60 ma., five times.	1 month	Complete disappearance of projection and symptoms.
23	Intra-mural growth in anterior wall, size of small cocoanut, rising to the upper level of iliac bones. Cavity, 4½ in.	45	Unknown	Hæmorrhage and pain.	Intra-uterine plus 20 to 80 ma., six times.	2 months.	Hæmorrhage arrested by first application. Subsequent relief of pain. No record of change of size.
24	Intra-mural growth posterior and to left. Whole mass size of goose egg. Cavity, 3½ in.	41	2 years.	Immense loss of blood at periods, which return in 21 days. Pain and tenderness. General health impaired. Profuse leucorrhœa.	Intra-uterine 100 plus to 15 ma., twice a week, later once a week.	3 months	Complete disappearance of growth, the cavity shrinking to 2½ in. Periods normal, without flooding or pain.
25	Intra-mural growth in anterior wall, nearly filling pelvis. Cavity, 3½ in.	36	14 years.	Flooding at periods, with pain, tenderness and leucorrhœa.	Intra-uterine plus 35 to 45, five times.	1 month	Flooding arrested and improvement of symptoms.
26	Intra-mural growth involving whole uterus, including cervix, filling pelvis and extending to crest of iliac bones.	33	2 years.	Flowing every day for two years; no tenderness and no adhesions.	Intra-uterine plus 50 to 85 ma., once a week.	2 months.	Hæmorrhage ceased after the first application.
27	Intra-mural growth, size of goose egg, in anterior wall.	40	2 mos. (?)	Pain and bladder pressure, with much local tenderness. Menstruation irregular. Leucorrhœa profuse.	Intra-uterine plus and — 20 to 50 ma., once a week.	1½ months	Complete symptomatic cure and reduction of tumor to the size of a walnut. The tumor is now sub-peritoneal. Menstruation normal.
28	Intra-mural myoma, extending an inch above navel, with a cystic projection on right, containing "cells of Drysdale."	47	7 years.	Attacks of intense pain at periods, in which tumor swells several times larger, jumping on ribs. No hæmorrhage. Health impaired.	Intra-uterine plus and — 40 to 150 ma., twice weekly. Method changed to vagino-abdominal alternatives, 150 ma. after 3 months with aspiration of cysts.	1¼ years.	Reduction of tumor to size of an orange and removal of all symptoms. No attacks for six months.
29	Intra-mural and sub-peritoneal projection from right cornua, reaching to 1½ in. of umbilicus. Cavity, 3½ in.	29	9 months.	Menstrual flooding every three weeks, with constant pain and tenderness. Menorrhagia.	Intra-uterine plus 25 to 70, once a week, with intervals. Vaginal applications for a time.	13 months.	Relief of pain and restoration of normal flow. Tumor slightly smaller, more disengaged into abdominal cavity.
30	Intra-mural enlargement of uterus, with projections to both sides. Electrode inserted ¾ inches.	44	12 years.	Menstrual cramps, requiring physician and morphia regularly. Flow lasts two weeks, and is profuse. Constant bleeding, lasting for months, requiring rest in bed; constant pain and tenderness; copious leucorrhœa.	Intra-uterine plus 20 to 60 about twice a week. Cramps followed treatment at first.	3½ months	Relief of pain and restoration of normal flow (5 days). Tumor distinctly smaller.
31	Intra-mural growth, size of large lemon, in left wall.	30	1 years.	Constant pain and tenderness; former attacks of bleeding; at present, pain and pressure symptoms.	Intra-uterine plus 20 to 30 ma., six times, with one — vaginal 100.	2 months.	Relief of pain, hæmorrhage and leucorrhœa. No notes of change in size.
32	Intra-mural enlargement of uterus to size of child's head, extending to 3 inches below umbilicus.	46	2 years.	Pressure symptoms in moderate degree, with vesical interference.	Intra-uterine — and plus 20 to 70 ma., twice a week; later uterine alternatives 70 to 100 ma., once a week.	10 months.	Relief of all symptoms; reduction in size to five inches below umbilicus.
33	Sub-peritoneal growth, filling pelvis and extending to 1½ in. of umbilicus, attached by sessile pedicle to anterior of uterus.	45	6 years.	Bleeding periods and local tenderness, associated with bronzed complexion, anaemia and nervous prostration.	Vagino-abdominal alternatives, 150 ma., with occasional intra-uterine — 30 to 100. Puncture impossible owing to bladder.	5 months.	Release of tumor from pelvis upwards into abdomen. Results otherwise negative.
34	Intra-mural and sub-peritoneal multinodular growth, size adult head, extending to 2 inches of umbilicus.	45	4 years.	Retention of urine recurring frequently caused tumor to be diagnosed. Much pain in left leg. Menses free.	Vagino-abdominal alternatives 100 ma., once per week. Intra-uterine treatment not well borne.	5 months.	Normal periods, great improvement in health and slight reduction in size.
35	Sub-peritoneal, sessile growth, extending from Douglas' pouch to 2 in. below umbilicus. Narrow; movable.	50	Discovery recent.	Menorrhagia and menorrhagia at three-week intervals. Constant pain and weight. Leucorrhœa.	Buried puncture — 100 to 150 ma., every two weeks.	5 months.	Relief of pain and pressure on bladder and reduction to 4½ inches below umbilicus (about one-half).
36	Intra-mural projection, size of walnut, in posterior wall. Cavity, 3½ inches. Fibroid ovary on right side.	36	5 years.	Ex-sanguinated by excessive and long-continued hæmorrhages.	Intra-uterine plus 30 to 60 ma., once a week at intervals.	6 months.	Normal periods free from pain at four-week intervals, with relief of weight symptoms and reduction of cavity to three inches.
37	Intra-uterine polyp, size of hen's egg, pedunculated.	52	5 years.		Intra-uter. faradic to extrude tumor without hæm. After expulsion it was removed by torsion of pedicle.	15 weeks.	Removal of tumor and restoration of health.

No.	Description of Growth.	Age of Patient.	Known Duration of the Growth.	Clinical Symptoms.	Method of Treatment.	Total Duration of Treatment.	Results.	When results were verified after Cessation of Treatment.
38	Sub-peritoneal mass filling pelvis and left side of abdomen to ribs, of uncertain attachment to uterus, extremely hard and firmly fixed.	54	12 years.	No symptoms until a recent attack of bowel obstruction. Health poor.	Vagino-abdominal alternatives 125 to 150 every other day. Eminent consultant diagnosed probable sarcoma.	125 3 months.	Bowel obstruction cured; tumor loosened considerably and slightly lessened in size.	2 months.
39	Intra-mural fibroid mass reaching to 1½ inches of umbilicus.	46	3 years.	Lameness and dropsy of right leg from pressure. Pain and local tenderness.	Vagino-abdominal alternatives 80 to 125 ma., twice a week.	80 to 125 2 months.	Removal of lameness in two weeks. Arrest of menstrual pain and slight reduction in size.	Recent.
40	Intra-mural fibroid, size of large apple, in posterior wall.	40	15 years.	Local tenderness, and pressure on bladder. Old history of hemorrhages.	Intra-uterine plus and—30 to 80 once or twice a month.	10 months.	Symptomatic cure and considerable reduction in size of tumor.	6 months.
41	Intra-mural growth, enlarging uterus to size of orange.	29	6 years.	Pain and profuse periods, which latter recur two and three times a month.	Intra-uterine plus 15 to 30 ma.	1 month.	Arrest of menstruation and cure of symptoms. Great reduction in size.	6 months.
42	Intra-mural growth in posterior wall, filling pelvis, and extending 2 inches above symphysis.	37	6 years.	Pain and profuse periods. Bladder much affected by pressure.	Buried puncture—250 to 60 ma. six times, and intra-uterine plus 35 to 60 ma. once a week.	6 months.	Partial relief of pain. Tumor reduced to a size that does not project above symphysis.	Recent.
43	Intra-mural and sub-peritoneal growth, filling abdomen to 1½ inches above umbilicus. Syphilitic suspicion.	40	12 years.	Pain and profuse periods. Locomotion painful.	Buried puncture—200 to 60 ma., and intra-uterine plus 30 to 50 ma. weekly, at intervals.	1 year.	Menstruation regular and less free. Tumor reduced to half inch above umbilicus.	Recent.
44	Intra-mural growth, size of sweet potato.	29	15 years.	Pain, profuse and frequent periods. Was opened for diagnosis by a surgeon three years before.	Vaginal plus 30 to 100 ma. twice a week.	1½ months.	Cure of symptoms. No change in size.	6 months.
45	Intra-mural nodule in anterior wall, doubling the lateral diameter of fundus.	35	6 months.	Incontinence of urine, pain and tenderness.	Intra-uterine—23, twice.	1 week.	Complete cure. Tumor delivered.	6 months.
46	Sub-mucous growth, enlarging uterus to fill pelvis, and reaching to ½ in. of umbilicus.	48	7 years.	Profuse bleeding constantly for several years. Now nearly exsanguinated. Much pain.	Int.-uter. plus 60 once arrested hæm. somewhat. Five mos. later a 5-lb. tumor was delivered per vaginam.	1 week.		

of the tumor; 79.4 per cent. in symptomatic cure with or without reduction in size; 5.3 per cent. were unaffected; and 2.5 per cent. were made worse. In other words, about 92 per cent. were successes and 8 per cent. failures.

THE COMPLETE CURES BY ABSORPTION.

Of the five cases of this, the first class, all were intra-mural in situation, and all were treated by intra-uterine applications.

THE CASES SYMPTOMATICALLY CURED AND ANATOMICALLY REDUCED.

Of the twenty-three cases of this class fifteen were intra-mural, four sub-peritoneal, three intra-mural and sub-peritoneal, and one sub mucous.

THE CASES SYMPTOMATICALLY RELIEVED WITHOUT ANATOMICAL REDUCTION.

Of the eight cases of this class, six were intra-mural, one intra-mural and sub-peritoneal, and one sub-mucous. Six of these cases were placed in this class because, being dispensary cases and difficult to find, no record of their condition could be secured after their pains had been relieved and they had ceased attendance. It is possible that reduction in size has since occurred in some of them.

THE FAILURES.

Two cases were materially unaffected by the treatment, and one was made worse. The two were Nos. 12 and 33. No. 12 was that of a patient who had two movable, painless, sup peritoneal growths attached to the uterus by long pedicles. There were absolutely no symptoms of these tumors beyond the physical fact of their presence, and as they were not situated favorably for electro-puncture and were giving no trouble anyway, they were left alone, after thorough trial of mild intra-uterine applications. No. 33 was a large kidney-shaped sub-peritoneal tumor attached to the anterior surface of the womb and lying between that organ and the bladder. As the bladder was spread out in front of it, fan-shaped, preventing puncture, resort was had to long continued vaginal alternatives; under these the tumor was released from the pelvis, but the patient was not sure that she felt any better.

The case made worse, No. 3, a large intra-uterine fibro-cyst, was treated by me early in my experience with these growths, and before it was pointed out by Apostoli that this form was liable to be made worse by electricity. The death from septicæmia did not occur until some time after the cessation of treatment, and during attempts to extract the mass surgically by piecemeal. At the autopsy the anterior wall of the uterus was found to have been punctured. This case bore a strong resemblance to one related by Emmet in his work on "Diseases of Women" (Case 39, page 587), in which death also occurred during attempts at extraction by piecemeal, and though

sent to me by an expert surgeon, was better adapted to treatment by hysterectomy than by any form of electricity.

METHODS.

It will be noticed that six cases were treated by puncture. The greater number of these punctures were of the kind that has been designated as "buried"—a variety of puncture that was originated by myself, and one that I think both more powerful and more safe than that described by Apostoli, unless the latter is extremely superficial. Unlike the Apostoli needle, which is only insulated by a movable sheath up to the point at which the puncture is made, my own needle is insulated by vulcanized rubber to within one centimeter of the end, with a view of preserving the track of the needle through healthy tissue from an electrolytic softening that would prevent immediate union. Punctures made in this way have been observed by me to heal in three days in spite of the use of 150 ma. at the point within the fibroid mass, while the older form of puncture may remain unhealed for a week or more.

No unpleasant reactions followed any of the punctures, which were sometimes exceeding an inch in depth; and while I do not say that any but those skilled in it should attempt this method, I do not hesitate to employ it myself in those somewhat rare cases that are adapted to it. None of the cases in which the tumor disappeared were punctured, but this was merely because their intra-mural situation neither required nor permitted it.

The intra-uterine method is certainly the method of choice, and with the elastic platinum electrode devised by me, or those of Martin, much of the risk of stiff-sounding is avoided. I have been disposed of late to increase the intervals between these applications to from five to seven days, interspersing one or more vagino-abdominal galvanic alternatives for their additional help.

These latter applications, which have been associated with the name of Danion, have a considerable value when neither of the two better methods are available. I have seen reduction occur during the use of this method in several cases, and can testify to its power over inflammatory exudates around these growths.

An important element of success in the electrical treatment of some fibroid tumors is persistence—a quality of value in many other forms of work.

CONCLUSIONS:

1. While an increasing familiarity with hysterectomy for fibroid tumors will doubtless render operators more expert in that work, and possibly lessen still further the mortality of the operation, accurate knowledge is yet wanting concerning the after histories of the cases re-

ported as successful, with special bearing upon the relief of painful symptoms, or their increase by the addition of post-operative incidents or accidents.

2. A conservative method of treatment which apparently acts by inducing retrogressive changes in the morbid process, resulting in a complete cure of over 12 per cent., and a practical cure of 74 per cent. of all cases, deserves most careful consideration from scientific men, since but few remedial measures for analogous diseases can lay claim to an equal measure of success.

3. The electrical method of arresting, reducing and dispersing fibroid tumors, besides being truly curative in transforming vitiated tissue action into natural absorptive processes, has the further merit of leaving intact all neighboring organs and functions yet existing, as the ovaries, etc., the current acting as a general revivifier of all highly organized parts and processes, while hastening the destruction of adventitious and lowly organized tissue.

TRAUMATISM OF THE CHEST.

Read in the Section of Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, Washington, D. C., May 5, 1891.

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In the course of my investigations on thoracic surgery for the *Annual of the Universal Medical Sciences*, I have been strongly impressed with the lack of knowledge in regard to the injuries of the chest. While this subject has been considered somewhat carefully in my two contributions to that work, there are many practical details of great importance which are not touched upon, owing to the paucity of data afforded by the very limited reports in this branch of surgical experience.

It is not my purpose now to enter into the minute distinctions of the lesions resulting from violence to the walls and contained viscera of the chest. I ask for the attention of surgeons to the great advantage of methodic treatment of traumatism of the chest.

All those inflammatory processes of a latent or idiopathic nature, which lead to serous effusions primarily or to suppuration secondarily, within the thoracic cavity, are excluded, as not germane to our present undertaking. In like manner, the very extensive lesions involved in operations for the relief of the above conditions in all stages do not come within the scope of this paper.

Foreign bodies entering through the trachea into the bronchi, and causing mechanical obstruction or inflammatory complications, call for consideration, from the general inflammatory impression transmitted to the pulmonary structure.

Blows upon the parietes of the thorax which propagate a shock to the lungs or heart, involving an impairment of function, or subsequent organic changes, come appropriately under the heading of traumatism, though no superficial contused wound is apparent.

Of course, all violence from without which produces injury to the structures within the chest, should be regarded as the proximate cause of the lesion, whether it be hæmorrhage, congestion or inflammation.

The grosser accompaniments or consequences of violence, consisting in notable contusion of the soft parts and fracture of the bony walls of the chest, are frequently the exciting causes of transmitted inflammation to the vital structures of the thorax.

Among the gravest injuries to the chest are the wounds by firearms and by cutting or puncturing instruments. These generally bring about the entrance of air into the pleural cavity, and thus, by pressure upon the corresponding lung, there is serious interference with the respiratory act. Should the pulmonary tissue be involved in the wound, there is likely to occur emphysema from the entrance of air into the areolar tissue of its parenchymatous structure, so as to effectually prevent the alternate expansion and contraction of the bronchial ramifications.

The former condition of pneumothorax may be a result of air escaping from the bronchial tubes when wounded, even when the external incision or puncture may be of a valvular nature which does not admit of the entrance of air from without.

If the external wound is patulous, the ingress and egress of air occurs with each act of expiration and inspiration, inducing the condition of traumatopnoea.

This is a most unpleasant result, and introduces a grave complication in the nature of the case.

There is also most frequently sanguineous extravasation into the pleural cavity from such injuries, and if the lung has not become collapsed from the entrance of air, its function of respiration is impeded, if not obliterated, by the blood pressure.

Should the parenchymatous structure be involved in gun-shot or punctured wounds of the lungs, there may be emphysema to a greater or less extent throughout the cellular tissue of the thorax and adjacent parts.

The constitutional or systemic effects of any violence to the thorax depends upon the amount of shock in the first instance, or the inflammatory process which is developed subsequently.

The greatest diligence on the part of the surgeon is requisite to avert the immediate fatal result of penetrating chest wounds. Apart from the general manifestations of chest wounds, there

are local effects from mechanical causes which require our consideration.

One of the most serious consequences of violence to the walls of the thorax is rupture of the lungs. A fall upon some solid body or the pressure of some heavy weight, while the lungs are greatly distended by closure of the glottis, induces rupture of the pulmonary tissue, with all the serious results of pneumothorax and hæmoptisis. This may occur even without an abrasion upon the surface of the chest; and the history of such an accident is the only explanation of the grave condition within the thorax.

A forcible impression upon the walls of the chest may fracture the sternum or ribs and drive either inwards so as to lacerate the lungs or the heart, leading to immediate or remote serious effects.

One of the grave consequences of an opening through the chest walls is the protrusion of a portion of the lung, constituting a hernia. If this should occur under the observation of a surgeon, he would find little difficulty in returning it and retaining it within by a compress. But most frequently it has been exposed for some hours and has become engorged, so that it is entirely impracticable to reduce it without enlarging the opening in the walls of the chest. This would seem the most feasible mode of relief if the vitality of the tissue had not been impaired by the constriction. But it is generally held to be safest either to allow the protrusion to remain and slough away, or to assist its detachment by placing an elastic ligature around the neck of the hernial tumor. The edges thus become agglutinated and the lung occluded. There may also occur laceration of the lesser or greater blood vessels of the thorax calling for prompt relief, if the injury does not prove immediately fatal.

It has been proven by subsequent observation of the effects that lesions of the heart have healed and that injury to the coats of the large arteries are not necessarily fatal. But there is no instance on record of a wound of the vena cava without a fatal result.

The thoracic duct, in like manner, cannot be wounded with impunity, and the escape of the lymph terminates in death.

While the ligation of the intercostal arteries, the internal mammary and the subclavian is attended with difficulty, the hæmorrhage from these vessels may be controlled, and the patient should not be abandoned to his fate. If blood has accumulated within, it may be withdrawn by suction, or its escape may be promoted by position.

Those who have had the largest sphere of observation in this branch of thoracic surgery will best understand the uncertainty hanging over pulmonary disorders resulting from violence.

Commencing with the doubts as to the production of traumatic pneumonia, and running through the abscesses of the parenchymatous structure of the lungs, it is remarkable how little is finally and definitely determined as a guide for practice in thoracic injuries. It will be found upon attempting to analyze the reports of such lesions that quite a variety of opinions are entertained by different observers, and that really no methodic treatment has been adopted generally by the medical profession. I know of no work on surgery which lays down fixed rules for the practitioner in the management of wounds of the chest.

The contributions to the literature of traumatism of the chest in Holmes' System of Surgery, Vol. I, in the International Encyclopædia of Surgery, Vol. II, in the Reference Hand-book of Medical Sciences, Vol. IV, and in the Annual of the Universal Medical Sciences for the years 1889, 1890 and 1891, represent fairly the status of this branch of surgery. Those who seek to keep abreast of the recognized data may learn from these works what has been accomplished for the relief of this class of injuries. It will be noted that there are conflicting views in regard to the proper treatment of some of the consequences of penetrating wounds of the chest, dependent, no doubt, to a great extent, upon the different standpoints from which observations are made. While there is a correspondence, for the most part, among different authorities in the propriety of closing the external opening in the wall of the chest, when the amount of blood in the pleural cavity is small, contradictory opinions are expressed when it is large.

To define more clearly the attitude of those who have written upon this topic, I may state that individual views of the nature of such injuries, with the steps recommended for their relief, rest very much upon personal observation, and not upon the consensus of general experience by the profession.

There are articles upon thoracic wounds in most of our standard works on surgery, presenting many points of a practical bearing, as viewed by the author, yet with such material differences in their application, under the emergency of treatment, as to avail little for the practitioner.

While we should not overlook the writings of former days, it may be stated that little progress has been made in the elucidation of wounds of the chest since the works of Gross and Agnew were presented, and some of the more recent authors, as Wyeth and Roberts, have touched upon chest injuries very briefly, while Senn ignores, with a few exceptions, traumatic developments of the thorax, in his principles of surgery.

Many important data, illustrating the results of gunshot wounds of the chest, are given in the Surgical History of the War, published by the

United States Government, and the statistics of non-penetrating and penetrating wounds of the chest therein presented, demonstrates the gravity of the latter as compared with the former in a most conclusive manner. This, however, only confirms the results of the records of military operations throughout the world, showing that about 1 per cent. of non-penetrating wounds of the chest prove fatal, while over 65 per cent. of penetrating wounds terminate in death at an early period after the injury.

One of the practical questions of greatest moment, in regard to the hermetically sealing of gunshot wounds of the thorax, remains unsettled.

Experiments upon the inferior animals, commencing with those of Houston in 1728, for illustrating the effects of punctures and incisions into the thoracic cavity, have been attended with such different results upon the lungs, that it is yet undetermined whether collapse ensues directly from the wounds. There is such an intimate relation of the surface of the lungs to the costal pleura, that something must separate them for the occurrence of pneumothorax, and hence it occurs that openings are not always followed by this result.

It is held that the falling away of the lung is not a uniform consequence of a penetrating wound of the chest. If the wound is small, or if it is at a distance from the free margin of either lobe, the expanded lung remains in contact with the costal pleura.

The adhesion of the two pleural surfaces is illustrated by an experiment of Surgeon A. H. Smith, in which, in a recently killed animal, an opening was made in an intercostal space midway between the sternum and the spine. The lung did not collapse; but on making another in the same intercostal space, close to the sternum, the outer surface of the lung was observed to slide backwards, though still remaining in contact with the chest walls, until the edge of the lobe came opposite the first opening. Then for the first time air entered here, and the pneumothorax became complete.

Gordon and McDonald found that with small tubes introduced into the chest, the breathing became quick and laborious, while the lungs had fallen away from the chest walls for an inch. After four minutes, they enlarged the wound and put in tubes whose united calibre was twice that of the glottis. The respiration became very laborious. On closing the wound, however, and applying friction to the chest, the respiration was restored, and in ten minutes the animal was able to walk about. It was killed on the fifth day and nothing notable was found in the chest.

Dr. Northrup reports some experiments on animals, contradicting the statements of Samuel West, that the force of cohesion sufficed to maintain the lung in complete expansion when the parietal pleura was punctured.

Further experiments were made, in which a dog's two pleuræ were fitted with double flanged canulæ, stoppered with corks. Until the dog recovered from ether, the two corks were left in place. When fully recovered one cork was withdrawn, and the dog scarcely suffered dyspnœa on moderate exercise. When both corks were removed the dog traveled about for two minutes and succumbed to severe dyspnœa, which again entirely disappeared on replacing the corks.

These results throw some light upon the practical resort to closure of the external openings into the pleural cavity as a curative measure in cases of penetrating wounds of the chest.

Howard's proposition to the Surgeon-General of the United States during the war, to test the process of hermetically sealing the external orifices of gunshot wounds of the chest, met with so much prejudice on the part of the surgeons of the Federal Army, that it was used in a limited number of cases. It is also inferred that the conditions under which this measure was tried were not favorable to its success, as the most grave cases were the subjects. Judging from my own experience of the good effects of closing penetrating wounds of the chest, and from the records of cases thus treated by others, it seems unfortunate that hermetically sealing was not applied on a larger scale, so as to afford the statistics for a final and conclusive decision as to its merits. Independent of the recognized advantages of closure in the lesser accumulations of blood in the pleural cavity, it is held by some, with a show of practical discernment, that in the most extreme cases of thoracic hæmorrhage, the flow of blood externally should be arrested by plugging the orifice, so as to favor the coagulation of the blood within, and by compression upon the lung to prevent further extravasation.

If this course is applicable in the most aggravated condition of penetrating wounds of the chest, as well as to the simpler form in which there is a slight hæmorrhage into the pleural cavity, why may it not prove serviceable in the intermediate accumulations of blood in the thorax, and thus be applicable to every variety of penetrating wounds of the chest.

It is not expected that a general rule can be laid down, without exceptions, for the immediate and complete closure of all penetrating wounds of the chest. There must be certain preliminaries observed in the preparation of the patient for receiving the benefits of such proceeding, so as to close the orifice with the least blood in the cavity of the pleura, that is possible. Placing the patient so that the opening shall be the most dependent part, with a firm bandage around the thorax, and making the occlusion immediately after the expulsion of air and blood from the wound by forcible inspiration, should promote a favorable result.

If the case is complicated with emphysema involving any considerable portion of the surface, plugging the orifice with a condom stuffed with sponges, as has been suggested for the arrest of hæmorrhage from an intercostal artery, will prove efficient in preventing the escape of air into the cellular tissue and at the same time accomplish complete occlusion of the thoracic cavity.

A comparison of this procedure may be made with that in which the air enters the cavity of the pleura and induces collapse of the lung, thus arresting the flow of blood from the wounded parenchyma, with a tube in the opening, as recommended by Packard, for prevention of emphysema. In this latter, the air pressure is supposed to arrest the bleeding. In the other condition, blood clot presses upon the lung so as to control the hæmorrhage.

The variable influence of the air in the pleura, with more or less air entering the lung by the inspiratory act of the sound side, renders this recourse very doubtful in permanently controlling the escape of blood from a wound of the lung.

On the contrary, the formation of blood clot within the pleura keeps up a pressure which can be relied on to prevent the further bleeding from the pulmonary lesion.

All those who have observed the relief of distressing dyspnœa by closing an open wound of the chest, concur in its great benefits.

It may be inferred from the favorable progress of cases in which a large accumulation of blood has remained in the pleural cavity, that its gradual absorption occurs. If the air is completely shut off from without, of course germs cannot enter to set up decomposition in the mass, even should there be a perforation of the bronchia, as it is held that air passing through this seive-like structure is rendered innocuous.

With the larger death-rate from penetrating wounds of the chest treated without special reference to the process of occlusion, the result is not likely to be more serious from a uniform adoption of sealing hermetically all external openings of penetrating wounds of the thorax.

If the worst consequence of this procedure ensues in purulent development, there is open to the surgeon such measures of relief as have been adopted successfully in empyema from other inflammatory processes.

In this connection, a few cases which have come under my observation, may serve to illustrate the open and closed methods of treating wounds involving the thoracic cavity.

Many instances of gunshot wounds of the chest were brought to my attention as chief Surgeon of Division, during the civil war in this country. But I had no opportunity of following up the subsequent course of those injuries; and would refer to reports of such cases in the Surgical History of the war for the results. I will give, how-

ever, an outline of some characteristic cases, occurring in my own private practice and in consultation with others, during the past few years.

One case had a pistol ball wound at short range between the fourth and fifth ribs, on the right side, in front, and ranging downward. All the physical signs were present, indicative of a wound of the right lung, extravasation of blood into the pleural cavity. It was kept open for a time, but closed afterwards spontaneously and terminated fatally.

Another case, in which a ball from a large Colt's revolver traversed the left side of the chest, entering through the lower border of the pectoral muscle and escaping between the ninth and tenth ribs near their cartilages, involved the pleural cavity. There was a discharge of frothy blood from the posterior wound and the physical signs of extensive sanguineous extravasation into the left pleural cavity. The heart was perceptibly pressed over to the right, carrying the apex beyond the median line. While no suture was used to close the wounds, they were hermetically sealed by antiseptic dressings, and notwithstanding considerable constitutional disturbance, subsequently the patient made a good recovery.

A third case was a child, accidentally shot, the pistol ball entering through the ensiform cartilage and ranging upwards. No precaution was used to close the wound, and the patient died from empyema.

The fourth case was from a pistol shot which entered just below the ensiform cartilage, ranging upwards to the right and lodging above the eighth rib, thus passing through the diaphragm and lower portion of right pleural cavity. The external hæmorrhage was not pronounced, but the presence of blood in the chest was inferred from the physical signs of dulness upon percussion, and diminution of the respiratory murmur under auscultation. There seemed to be no indication for occlusion of the external wound, and it was therefore left open. As there may have existed complications involving the abdominal viscera, the fatal termination on the fourth day cannot throw any light upon the true cause of death.

The fifth case affords an instance of a pistol ball entering the chest, immediately over the heart, traversing the mediastinum and lodging upon the sixth rib of the right side just behind the posterior axillary line. The external wound was occluded, and the ball was not removed until after the general shock and slight inflammatory reaction had passed off. The patient made a good recovery by the strict observance of masterly inactivity.

This case, with that preceding, having the ball lodged superficially for several days before removal, seems to emphasize the caution against cutting down and extracting a ball under such circumstances at the outset.

I recall in this connection, after the first Manassas battle, allowing a minnie ball, which was impacted in the clavicle and first rib, to remain, lest by its extraction the chest cavity should be exposed; but the final result of the case is not known.

The practice of removing balls lodged between ribs, which is inculcated in Agnew's Surgery, without proper limitation, is more honored in the breach than by the observance. It is evident that the immediate extraction of a ball from the border of a rib, after it has traversed the chest, must leave an opening into the cavity of the pleura and aggravate the gravity of the case.

A counter opening in the muscular structures for the removal of a ball which is near the surface, does not in the experience of surgeons of large practice, retard the healing process along the line traversed by the ball.

But with the conditions presented in a gunshot wound in the thorax, when an opening already has been made by the entrance of the ball, it is not good surgery to make another for the extraction, until the wall behind has become solidified.

In illustration of the effects of punctured and incised wounds of the chest, a few examples of knife stabs, which have occurred in my practice, will be added.

A case of stabbing, between the fourth and fifth ribs, in front of the anterior axillary line on the left side, was accompanied with localized emphysema. While there was evidence of sanguineous effusion in the pleural cavity, the bleeding was profuse externally.

There was slight dyspnoea upon lying down, which was relieved in the sitting posture. The wound was closed by adhesive plaster with a compress and bandage, and the patient recovered without an untoward symptom.

It has not been found necessary to use stitches in these wounds inflicted by the thrust of a knife blade, as the coaptation is effected by the above process, so as to hermetically close the opening in the chest.

In another case a stab was inflicted between the sixth and seventh ribs on the left side near the margin of the scapula, from which blood and air escaped at each inspiration, with considerable accumulation of blood in the pleura, and hæmoptysis. The external wound was closed immediately after a gush of blood and air from the opening. The patient became more quiet afterwards. This case was accompanied with traumatic pneumonia and marked constitutional disturbance, but ultimately recovered.

A third case came under my observation in which a knife blade entered between the fifth and sixth ribs on the right side, penetrating the lungs and attended with the accumulation of blood in the pleural cavity. There was no very marked dyspnoea, and as the flow of blood exter-

nally gradually diminished with the dependent position of the wound, it was not thought that closure of the opening was indicated. Inflammatory symptoms soon developed with subsequent adhesion of the pulmonary and parietal pleura. In the end, suppuration of the lung found its way through the external opening. A weak solution of carbolic acid was injected into the suppurating tract daily, and the healing process progressed favorably, so that there remained eventually but slight impairment of the lung from the injury.

The inference from these cases goes to prove that suppuration is more likely to occur when the incised wound is left open than when it is closed immediately and kept occluded.

A fourth case was seen some days after a stab had been inflicted between the seventh and eighth ribs, and there was a protrusion of a small globular mass of pulmonary tissue from the wound. As it had occurred shortly after the injury and was tightly constricted by the margins of the wound in the thoracic wall, the neck of the hernial tumor was encircled with an elastic ligature, as most likely to effect a prompt and safe detachment of the mass. In a few days it separated, and there was no further trouble with the case. If there was any escape of blood into the pleura it was most effectually shut in by the plugging of the opening, and afforded an illustration of the favorable issue of hermetical sealing in penetrating wounds of the thoracic walls.

IS EARLY RESECTION OR CONSERVATIVE TREATMENT ADVISABLE IN COXITIS?

Read in the Section of Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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While our increased knowledge of the pathology of tuberculous joint affections has resulted, in most joints, in earlier operations, in order to remove the local focus before the joint has become totally disorganized, the same cannot properly be said about tuberculous affections of the hip-joint. We still find the same disagreement between the adherents of conservative and operative treatment, and I scarcely say too much when I state that, in the vast majority of cases, excision is still made as *ultimum refugium* only. Yet even in these cases, a better knowledge of the pathology and consequently improved operative methods, have been followed by decreased mortality and improved functional results. In order to decide the question, it seems proper shortly to study the pathology of coxitis. We formerly believed that tuberculous affections of the hip, or, for that mat-

ter, of any other joint, commenced as diffuse inflammations, which went on to destruction of the joint. Post-mortem examinations were rare, except in cases which represented the later stages of coxitis. In these the synovial membrane was always found diffusely diseased, the ligaments and the perisynovial tissue changed to gelatinous, œdematous or fibrous tissue, the joint itself filled with fungous granulations, the cartilages generally ulcerated and shed, leaving the epiphyses in a state of softening and caries. But often we found the cartilages more or less intact, and we therefore believed that the synovitis was the primary lesion, the disease of bones and cartilages secondary. The tuberculous bacillus was unknown, and we supposed a dyscrasia present. Furthermore, all acute infectious diseases were known to be followed occasionally by inflammations of the joints, which always commenced as a synovitis, as in pyæmia, puerperal fever, typhus, scarlet fever, etc. It was acknowledged that the inflammation occasionally might commence in the bone, but it was believed that it even then commenced as diffuse inflammation of the medullary tissue in the epiphyses.

We overlooked that these diffuse processes, whether in bone or in synovialis, were secondary, and were the result partly of an infection, partly of reactive and reparative processes.

It is the Germans, particularly the late Prof. Volkmann and Prof. Kœnig, both of whom I quote extensively in this paper, to whom belongs the credit of proving that the fungous or tuberculous joint affections commence, in the majority of cases, as a local focus in the bone, and that the consecutive entrance into the joints of the *materia morbi* from the local focus produces the diffuse inflammation of the synovialis and the epiphyses. That the disease, in a few cases, may commence as a synovitis, is not denied, and is occasionally proved by post-mortem examination.

This is by no means a generally accepted theory. Habernern, for instance, states that in 132 cases of excision, a primary osseous lesion was present 80 times, 23 times a primary synovial affection, while the starting-point was doubtful in 29 cases. Watson Cheyne thinks the disease more often primarily osseous, although not in the proportion Habernern states. The trouble is that only in early cases can the presence of a local focus be shown. In late cases we find exactly the same changes in bones and joint, whether the disease started as an osseous or synovial inflammation.

It is, therefore, probably true that the vast majority of cases commence, as Volkmann says, as an osteitis and not as an arthrosis, and more particularly as a circumscribed cheesy or tuberculous osteitis or osteomyelitis.

It depends upon circumstances whether the joint later becomes attacked, viz.: whether the

products of the inflammation perforate into the joint, as usually, from anatomical reasons, occurs, or seek the surface. The primary focus, at least in childhood, is always in the bone, either central or near the periosteum. Generally only one focus is present, and it is rarely the case that both epiphyses are attacked simultaneously.

The focus is generally small, as large as a cherry-pit, or at most as a nut. The neck is the point of predilection, in the near neighborhood of the epiphyseal cartilage, or in the diaphysis or trochanter major, while the head is rarely the starting-point. The focus may perforate the epiphyseal cartilage in order to invade the epiphysis. It may even commence as a chronic osteomyelitis in the cavity of the femur, and work its way upwards. Primary attacks of the acetabulum are probably more frequent than generally believed. Habereru states that in his 80 cases, the acetabulum was attacked alone in 50 cases, the femur alone in 23 cases, and both together in 7 cases.

The focus presents itself as a little cavity filled with cheesy granulations and bone detritus, and frequently a sequestrum and surrounded with a pyogenic tuberculous membrane. Sequestra were present 51 times in Habereru's 80 cases, soft caseous deposits 29 times. If the focus perforates into the joint, tuberculous synovitis occurs, with very acute symptoms. If the focus is in the neck or trochanter major, the joint occasionally escapes, the osteitis and abscesses being extra-capsular.

While the osteitic process is going on in the neck and before perforation takes place, we may discover changes in the joint itself. The synovial membrane, the periosteum and the periarticular tissue become more or less infiltrated and œdematous, slight exudation may occur, and a partial obliteration of the joint may take place; little by little the whole synovial membrane may be changed into a granulation-tissue, and yet we have no tuberculous arthrititis. When at last the perforation occurs, it is into a half obliterated joint, and the symptoms are therefore proportionately less, as a joint reacts the more severely to infectious products when the synovial membrane is physiologically intact, and the less severely the more the synovial membrane has been changed into a granulation-tissue. This partial obliteration we meet particularly in the knee-joint, but less often in the hip-joint, where we consequently are more apt to meet acute suppurative arthrititis. Yet even here we occasionally see a central necrosis of the head and neck being followed by an obliteration of the joint, thereafter destruction of the epiphyseal cartilage and diastasis of the head, which meanwhile has become firmly attached to the acetabulum. As a rule, the hip-joint is attacked early, as the whole neck, in which the local focus generally is found, is inside the synovial capsule, but we may see the joint escape

even when the focus starts as a central necrosis in the head or neck. A carious fistula may then be found perforating outward through the trochanter major. This point is of importance, as indicating the way in which such a central necrosis may occasionally be attacked, through trephining of the trochanter and the neck or by ignipuncture.

The perforation of the tuberculous local focus having occurred into the healthy or half obliterated joint, farther pathological changes take place, while at the same time the symptoms of coxitis, which so far have been vague and insignificant, become pronounced on account of the implication of the synovial membrane, the cartilages and adjacent Haversian canals. The characteristic symptoms are particularly the starting pains and the muscular contractions, both indicating osteitis in the neighborhood of the joint cartilages, while the position of the limb (abduction, flexion and rotation) is less characteristic, probably depending upon other causes.

The pathological changes are those of a tuberculous synovitis with its resulting destructive processes.

The round ligament, which is covered with synovialis, is early attacked and softened, and then disappears.

The osteitic process generally commences at the place of insection of the sound ligament to the head and acetabulum, and on the neck at the place where the synovialis is attached. The cartilages become ulcerated by pressure of the granulations (Voikmann's Ulcerative Decubitus) or shed by pressure of the granulation-tissue, meanwhile developed in the dilated Haversian canals. The bones are now in a state of osteoporosis; the head loses its roundness and becomes smaller from pressure just as the acetabulum enlarges by pressure upwards and backwards, or becomes perforated by gradually developed decubitus, and spontaneous dislocations and intra-pelvic abscesses result. Peri-articular abscesses are rarely the result of the breaking down of granulation tissue in the peri-articular tissue. They occur usually from softening and perforation of the capsule itself. So much in regard to the pathology. Yet I wish at this stage to show a pathological specimen which to the fullest illustrates the pathological process as here described; the patient is a little girl of 10 years of age, who entered the Sister's Hospital in Buffalo in March, 1891. She had then been sick only two weeks, and a physician had opened an abscess on the outer side of the right femur. Contra-openings were made in the hospital and the abscess found to be situated beneath the vastus muscles, but apparently not connected with the hip-joint, which seemed healthy. Two weeks after entering the hospital she grew worse and offered the usual symptoms of coxitis. Under chloroform

the joint was examined and a carious process found on the upper side of the neck. A good sized abscess was found in the pelvis and opened. As this abscess was supposed to indicate perforation of the acetabulum, I removed the head and neck, which I here show. You see a local focus in the neck which had opened into the joint, the synovial membrane of which was found thickened and tuberculous. The round ligament had disappeared and at its place a carious process is going on. The cartilages are yet healthy. I suppose the carious process on the upper surface of the neck gave occasion to the first abscess, and that the tuberculous focus perforating into the joint produced the acute symptoms of coxitis. In this case the excision was performed about four weeks after the beginning of the disease. In another case, operated at the same time, the disease had lasted two months. I found there a sequestrum in the neck, three-fourths of an inch long, a perforation into the joint, shedding of the cartilage, osteitis of the epiphysis, diastasis of the epiphyseal cartilage and tuberculous synovitis. In both cases the operation cut short the disease, the wounds healed rapidly and the final result will be what I have always obtained, a movable joint with some shortening, which is easily overcome by aid of a thick sole. I consider this specimen of peculiar value as showing the condition in the early stage. In later resections, in which we find diffuse osteitic processes of head, neck and trochanter major, destruction of cartilages and tuberculous degeneration of the synovial membrane, it is impossible to find the local focus, as everything is diseased, but that does not prove that it was not present in the start.

Coxitis may under favorable conditions, terminate in recovery in any stage, of course with more or less deformity, and the usefulness of the limb depends upon the amount of flexion and adduction. A perfect recovery with normal joint is rarely obtained. I myself remember only one case. And with what cost is this imperfect recovery with a more or less deformed limb, obtained? It means years of suffering and treatment, be that with extension in bed or with a portable apparatus, frequent operations for abscesses with resulting fistulas, the dangers of amyloid degenerations of liver and kidneys, and of tuberculous meningitis, and lastly of an excision as *ultimum refugium*, at a time when neither the broken down constitution of the patient nor the extensive destructive processes in head, neck and shaft favor reparative processes. In those cases in which we do not have an abscess, the tuberculous focus has probably become incapsulated, surrounded with a zone of sclerotic bone tissue, and the synovial membrane is not tuberculous, although the joint may be partially or totally obliterated. In these cases conservative

treatment is probably indicated. But if abscess is present, it shows that perforation has occurred and in my opinion an early operation is the only thing that can arrest the disease.

And yet, why wait for abscess? The tuberculous bacillus, as is well known, is not a pyogenic bacillus and may under favorable circumstances continue to grow and infiltrate surrounding or more distant tissues. If abscess occurs, the pyogenic bacterias, particularly the staphylococcus pyogenes aureus, will always be found present as the cause of the suppuration. The chronic pathological process has only become complicated by the acute suppuration, and the tuberculous process keeps up advancing simultaneously with the suppuration.

It must not be forgotten, that the statistics of resection must be compared with the statistics of those conservatively treated cases, in which abscesses were present. In both classes we find a great decrease in mortality in one time.

Leisrink, for instance, gives a mortality of 63 per cent. after resection, of which 22 per cent. succumbed to wound complications, 21 per cent. to marasmus, 11 per cent. to phthisis, 7.5 per cent. to amyloid degenerati, etc. A more recent English statistic of 320 cases showed a mortality of 40 per cent. Jacobson has increased Leisrink's statistics of 176 cases to 250 cases and finds a mortality of 40 per cent. The result of conservative treatment was even worse. Of 63 conservatively treated cases in Copenhagen 73 per cent. died and 27 per cent. recovered. An English statistic of 384 conservatively treated cases, in all of which abscesses were present, showed a mortality of 67 per cent., a recovery of 33 per cent.

If abscess was not present, 69 per cent. recovered. Grosch (1882) found a mortality of 28 per cent. under antiseptic treatment.

Koenig states in a recent work, that it is an exception that a patient dies after resection of acute or chronic sepsis. In spite of the decreased mortality following resection, surgeons still differ in regard to the advisability of conservative or operative treatment. Two English surgeons of large experience, March and Wright represent well the different opinions. March is strictly conservative and considers excision uncalled for. Continued rest, he says, gives a mortality of only 5 per cent., and 70 per cent. recover with slight lameness and loss of motion. Even when suppuration has occurred he gives a mortality of only 6 and 8 per cent.

Dr. Wright, on the other hand, with an experience of more than one hundred cases of excision, of which only three died as a result of the operation, strongly advocates excision as soon as external abscesses occur, yes, even before the capsule has been perforated. He maintains that excision cuts short the disease, saves pain, lessens

the time of treatment and gives a better functional result. Osteomyelitis once established, nothing short of excision can, in his opinion, prevent the progress. Nature can, of course, get rid of the caries and necrosis, but the children who can survive the elimination are few, except among the well to do. The decreased mortality and the better functional result are the result of our increased knowledge of pathology and improved operative methods. Formerly we simply excised the head and perhaps neck and trochanter, but we left the tuberculous synovial membrane and discredited the operation because, as might be expected, suppuration continued or increased and our patients died of marasmus, amyloid degenerations, tuberculous meningitis or phthisis. Modern pathology has taught us that coxitis is primarily an osteitis, secondarily, a tuberculous synovitis and arthrosis, and that it is necessary not only to remove the bone affection, as we formerly did, but to remove the tuberculous synovial membrane just as well. If anything is left of that, relapse is sure to occur. The same is true about the tuberculous pyogenic membrane covering the abscess. If all diseased tissue of bone and synovial membrane is removed we may get healing of the wound by first intention even, just as we see it in operations on the knee-joint. I am even inclined to go a step farther than Wright, and advocate still earlier operation in order to remove the local focus before diffuse inflammation of bone and joint has occurred. I tried this recently in the case of a little girl, who had been sick six weeks and who had considerable infiltration around the neck. I made an anterior incision (Barker's), between Sartorius and tensor vagina femoris muscles and exposed the neck with ease, the extensor quadriceps femoris being pulled inwards. I found under this muscle a great mass of tuberculous material, which had not yet broken down into pus, and removed it, but I could not find the local focus, although, by flexing the hip-joint, I could examine the whole lower surface of the neck. I closed the wound with sutures and it healed by first intention. She did not improve, and three weeks after I resected the joint, found the sequestrum, three-fourths inch long, near trochanter, and a complete disorganized joint, diastasis of the epiphyseal cartilage, etc. The patient left the hospital recovered in three weeks. I show you the preparation here.

Mr. W. H. Battle reports a similar case in the London Clinical Society. He successfully removed a local focus, washed out the joint, and the child recovered in four weeks.

If the disease commences in the acetabulum (and according to Habernern this should occur in five out of eight cases), operation would be still more indicated, as the dangerous complication of intra-pelvic abscess is apt to follow. This com-

plication has formerly been considered an absolute indication for resection, but Bardenheuer, of Cologne, has several times resected acetabulum in such cases, by aid of his symphyseal incision (extra peritoneal explorations—Schnitt). But even if it is possible, yes, comparatively easy, to resect the acetabulum in this way, we are forced to leave behind the tuberculous synovial membrane and the secondarily affected head and neck of the femur, and the disease, I judge, would proceed in spite of this operation.

Still one question remains, whether the limb is better after the excision or after conservative treatment?

Holmes thinks that shortening is generally greater after excision and the limb less firm and less useful. Motion is more frequently present and more extensive, but the patients walk more insecurely and with more limp. Jacobson thinks the average results obtained by conservative treatment superior to those following excision, particularly in adults, where we often get flail-joints after excision.

Wright, with his large experience, thinks that excision gives better results and that much shortening depends upon using the limbs too early.

It is evident that the best result following excision cannot compare with the best result following conservative treatment: *restitutio ad integrum*. We must compare those conservatively treated cases, who have got well in spite of abscesses, caries and years of suffering, with those, in which, for the same reasons, excision was made. Few get well by conservative treatment, extending during years, without considerable flexion and adduction. To treat such a case demands such continual patience from the side of the parents, the patient and the surgeon that a good functional result is almost out of the questions unless the patient be treated in a hospital, where the surgeon has complete control over the patient and nurses. It might therefore more properly be asked, whether a flexed and adducted limb is more useful than a shortened limb after resection?

Judging from my own limited experience, I believe that excision gives a better functional result and a better looking leg than does conservative treatment in the majority of cases, particularly if you can sever the bone above trochanter minor. If you are forced to go below trochanter minor you are very apt to get a flail-joint. In early, or comparatively early operations, the disease will probably always be found confined to the head and neck.

I have during the last few years resected the hip-joint ten times, eight of which recovered with good and useful limbs, two died of other causes, independent of the operation.

The earlier the operation has been done, the better has the functional result been and the

quicker the recovery. The last two cases, the pathological specimens of whom I have shown here, left the hospital with healed wounds in three or four weeks, but have, of course, not yet been allowed to use their resected limbs. Most of the cases presented themselves in the third stage of coxitis with extensive carious destruction, large abscesses and broken down constitutions. Yet even these cases, who had been treated conservatively for a long time, were by prompt excision restored to health and comfort and provided with a firm and useful limb.

OSTEO MENTHESIS.

Read in the Section of Surgery and Anatomy at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY B. MERRILL RICKETTS, M.D.,
OF CINCINNATI, O.

I wish to call your attention to the subject of osteo penthesis, the subject of which I made brief mention at the last meeting of the New York State Medical Association, which convened in New York City.

Dealing with bone tissue has been one of the most interesting subjects to me, and I may say to surgeons in general.

The three principal points which I wish to bring out in this paper are as follows:

First: How and when may bones be restored?

Second: Should fragments of the bone be permanently removed except in case of amputation?

Third: Should not exploratory incisions be made in cases of fracture of bones where doubt exists as to their character?

I cannot do better, after making brief mention of these three interesting features, than to report the observations I have made in experimenting with the lower animals.

In the first case: How and when may bones be restored? I would say, in this class are included those cases in which the restoration of the bones, of the hands, feet, arms and legs have been removed by trauma or surgical interference without amputation.

Bone grafting, or osteo penthesis, is subject to as great a number of successes as skin grafting.

I am thoroughly satisfied, after having carried on my experiments, during the past year, that its confines are not narrow by any means.

It was Poncet, who restored the tibia within nine months, by grafting to the superior articular surface. The replanting of trephine buttons is now the established rule.

The dentists have accomplished a great deal in transplanting, replanting and implanting teeth.

The series of experiments that I have adopted to show what can be done in the way of substitution, that is, transplanting the bone of one animal to another, is not as yet complete. Suffice it

to say, that enough has been accomplished to satisfy me that sooner or later, the long bones and ribs of the lower animals will be successfully transplanted for the purpose of restoring osseous structures, destroyed by any cause whatever, except that of malignancy.

I am inclined to believe that the tails of such animals, as the dog, cat, opossum, etc., after being divested of the integument and soft tissue, may be transplanted with success, as the various joints will become ankylosed, and they may perhaps supply a long felt want.

It may be found that the ribs of the lower animals can be substituted for metatarsal and metacarpal bones.

In all cases as much of the periosteum should be preserved as possible, and the bones cut with a knife or chisel, or the finest saw that can be had, preference being given to the knife, as the ends of the bones are smoother, a condition more likely to be followed by good results than if severed with a saw. I have not yet been able to save a finger, in case of injury, where the bone was completely divided by a saw; I have, however, been successful in securing union in several instances where the bone was severed with sharp edged tools. In all cases of injury when the bone is divided by the saw there is more or less foreign matter, fine in character, carried into the wound, and its removal is attended by the greatest difficulty. Thus it is these two elements, a roughened bone surface and foreign matter, that make union difficult, and yet, with the larger bones, it is absolutely necessary to use the saw. This once done, the ends may be scraped and perfectly coapted, after which the periosteum overlying the two bones is brought together and stitched with fine catgut.

I will say in this connection that I do not favor the use of the forceps in amputating any member; the objection lying in the possibility of fracture. The saw should invariably be used; with the forceps the work is more rapid but less scientific, and there is no excuse for any man applying them.

Second: Should fragments of bone be permanently removed except in case of amputation?

Bone fragments, in either compound or compound comminuted fractures. Where a bone is crushed or broken into two or more pieces, the greatest care should be taken to replace the fragments, and to offer every opportunity for their union so that its strength and original shape may be preserved. That this may be made more certain, all clots and foreign matter should be cleared away and shreds of tissue removed from between the fragments, which should be immediately restored to their proper places.

In some cases, as in long bones, the fragments may be brought together with a silver wire, which may afterwards be removed.

In dealing with the fragments, cleanliness is,

above all things, first to be considered. Each fragment should be thoroughly cleansed with water at a temperature of 115° or 120° . Constant irrigation of the wound with water at this temperature is by far more preferable. If the fragments have been removed from the limb by injury or otherwise, they may likewise be restored. In compound fractures, where there are two or more fragments, it is best to allow them to remain and clean by irrigation and scraping, as the periosteum overlying these fragments will enable union to take place much sooner. If a portion of the shaft has been removed and cannot be found, I am inclined to think that small fragments, such as shavings and dust, would be the most desirable way of restoring the lost part. These bones may be from the individual himself, or from any of the lower animals. This was first suggested by McEwen, of Edinburg, and it was by this means that he restored one-third of the radius in a boy.

I am also inclined to believe that bone grafting can be more successfully accomplished in persons under 15 years of age than those older. This can be readily understood when we consider the activity of development of bone up to this age. The bone is not so brittle and the vascular supply is more perfect. It is at about this age in life that we cease to find the green stick fractures.

I am also inclined to the belief that bone would be more easily grafted near the epiphyseal line.

It is an established fact that bone cannot be grafted to any other tissue than that of bone, and that epithelial tissue cannot be grafted to any other than epithelial tissue; so that, if we can secure a sufficient amount of periosteum to overlie these fragments or grafts we will have union more certain and rapid.

In cases of compound fractures, especially where the bone has been crushed, we must first ascertain the condition of the blood vessels and nerves. These being intact we may rest assured that our patient loses no time in making the attempt of saving the fragments or restoring any portion of a bone that may have been removed.

Third: Should not exploratory incisions be made in cases of the fracture of bones where doubt exists as to their character?

Being conscious of the great difficulty that is almost invariably encountered in determining the exact condition and character of fractures, my attention has been especially called to an investigation in this line.

It is so often the case in fracture of the long bones, especially in fleshy persons, that we are utterly unable to determine what the state of affairs is. Until a comparatively recent date the injured extremity was placed in a support of

some kind, and the bone allowed to heal *ad libitum*. Now, this having been an established custom for so many centuries, it may seem rather out of place at this time to suggest a different procedure, with my limited experience, from a practical standpoint, but having recently carried my observations over a series of experiments, I feel somewhat at liberty to bring this matter before you.

It is with chagrin and humiliation, many times, that we look upon the result secured in putting these fractures in plaster, or in any dressing whatever, and allowing them to take their course. We have no definite means of determining whether the fracture is transverse or diagonal. Now, this being the case, why are we not justified in making exploratory incisions in cases of fracture, as well as in obstruction of the bowel?

If cleanliness is the greatest desideratum—which I have every reason to believe it is—if it is through clean surgery that we secure such brilliant results as have been secured within the past, why need we fear any serious consequences in making a simple fracture a compound one?

True, the bone will never be as perfect as it originally was, but then there is the great satisfaction of knowing whether there are one, two or three fractures.

In all cases of fracture, especially compound, there are more or less clots and shreds of tissue, perhaps muscular, ligamentous or cellular tissue, involved in the fracture. An exploratory incision will enable these to be removed and the fragments of bone closely coapted and union made more rapid and certain.

Of course, this procedure would be confined almost entirely to the long bones; however, the same rule would hold good in the injury of the cranium.

In cases of a blow received upon the head, we are not able to determine whether or not there has been a fracture either of the outer or inner table. The infiltration is many times so extensive that it is impossible to arrive at any definite conclusion. Now, why should we refrain from making a simple incision through the scalp, at any point, when the risks are so slight and where the good to be derived is so great?

One of the greatest principles involved in surgery, as in medicine, is to determine the cause and the state of affairs.

The sense of touch is of itself one of the greatest means of enabling us to arrive at definite conclusions.

However, the eye is equally important in many things; although it may not be possible to get a view of these fragments, it is possible for us to determine definitely what the condition is, simply by the sense of touch.

Many times the incision may not be any larger than to admit the index finger, but the finger once introduced, the state of affairs may at once be determined and thus save us from malpractice suits and the humiliation that we sometimes experience in treating fractures.

The incision once made, the question would then arise as to how the fragments of the bone may be best secured, that they may be replaced to their normal position and allowed to remain so until Nature comes to our rescue. I would say, in this connection, that I have found nothing to equal the silver wire, secured with an Aveling coil and mounted with a perforated shot. The wire may be passed around the fragments by means of a Collins' needle. The wire is made taut by an Aveling coil mounted by a shot. This may be allowed to remain indefinitely, as it causes no irritation. It may be removed at the end of four, six or eight weeks, in which case it is best to have the coil to stand at a right angle to the bone or the ends of the wire may be secured, the coil placed parallel with the bone, the periosteum be made to overlie it and allowed to remain. In this case, the bony structure is thrown out and soon encompasses the wire and its attachments. As many of these may be used as may be necessary. So far I have not seen any bad results. With one or two of the dogs I found that the integuments healed and that they caused no serious trouble.

The fragments once secured by this means, the wound should be closed and the drainage tube, which should be rubber, inserted; as we are more likely to need drainage in the reparation of the bone than any other tissue. As to the after dressing, I have found nothing better than the application of simple water dressings. These enable the wound to be kept soft and the discharge to escape freely. Towels saturated in boiled filtrated water, can be applied every hour or so as the occasion may require. It may, or may not, be necessary to place the injured extremity in plaster.

Of all the dressings, I think the plaster is the most desirable. It has been my desire in bringing this paper before you, to excite an interest in this very important matter; knowing that it will require a great deal of time, experimentation and observation to enable us to arrive at definite conclusions, in this as in all other matters, I am desirous of having your coöperation and assistance in bringing this subject before this Association at its next meeting, wherever it may be.

A JAPANESE MEDICAL NOBLEMAN.—The Emperor of Japan has named Dr. Hide Miyake, professor in the Medical Faculty of the Imperial University of Tokio, a member of the House of Peers.

AN ABDOMINAL WICK.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 1891.

BY ROBT. T. MORRIS, M.D.,
OF NEW YORK.

In my first sixty-three laparotomy cases, dependence had been placed upon a drainage tube that was so efficient, so ready at hand, and so simple in its workings that I thought it good enough to be patented. That drainage tube was the patient's intestine, running through the middle of the great lymph bag of the abdomen, and ready to abstract from the sac any collection of fluid that was enticing to microbes, and to set it out of doors where their fatal breath would be exhaled into valueless space as they fought for possession of the sports.

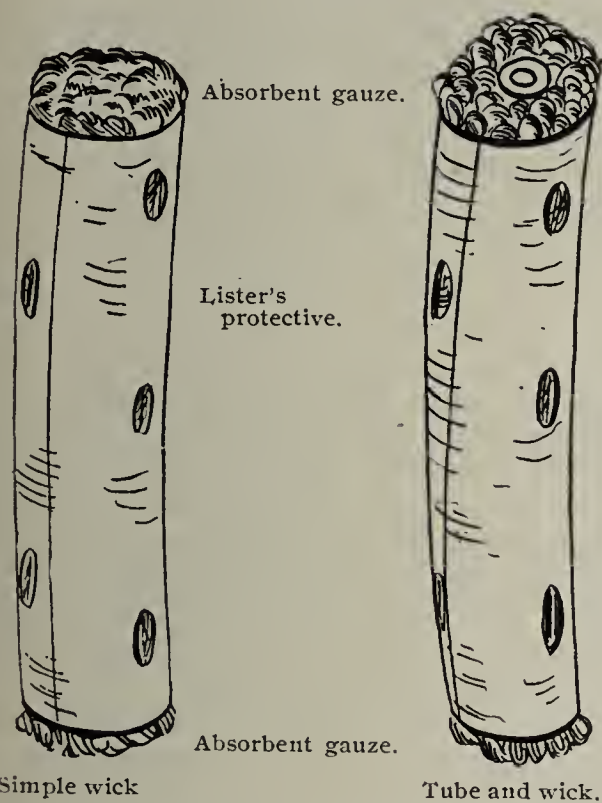
Deliquescent salts passed through the alimentary canal or injected into my drainage tube by way of the anas had cleared the great lymph sac by osmosis so regularly and with such ease that any other sort of tube seemed to be a superfluity.

But one day this fine drainage tube failed. The case may be spoken of unpoetically as "number sixty-four," in order to avoid the identity that goes with initials. There had been a moderate degree of oozing from adhesions after the removal of her large ovarian cyst, but this was not disturbing to my assistants at the hospital, who had often managed similar cases without a ruffle of anxiety as to the outcome. This patient's bowels, however, failed to respond to the seidlitz powder on the following day. Then a large dose of Rochelle salts was given without effect. The patient was rapidly developing a septic peritonitis, and continued attempts at getting an evacuation from the bowels by means of Rochelle salts by mouth and by rectum were failures. Finally I reopened the abdominal cavity and out ran a thin wicked stinking fluid that had caused all of the mischief, but it was too late and the patient gradually failed and died. Her family and her physician had put confidence in me and that was what I had done for them. An artificial drainage tube introduced at the time of the operation or at the beginning of the peritonitis would probably have saved the patient's life, and I should have been spared remorse; but if one could have all experience at once it would not be necessary to go to the bottom of such a dark well for truth. I could not believe in time that the patient's bowels were not going to act as other bowels under similar circumstances.

My reasons for not using artificial drainage tubes after abdominal operations had been good ones. I had known of several fæcal fistulæ that had followed the use of hard tubes, and secondary infection can easily take place through the stright and narrow way that leads to destruction. Soft tubes collapse. Gauze used for abdominal

drainage may become so firmly adherent to the intestines that its removal means peril for the patient. Then again I know that the introduction of artificial drainage tubes mean a good deal of extra trouble for the surgeon. Of course, no one cares how much extra labor and trouble he is put to if he can thereby save life and prevent suffering, but it seemed unnecessary, judging from my facts in experience up to the time of losing the patient just referred to. Since that time I have occasionally thought it prudent to use artificial drainage apparatus, and to avoid the dangers of hard and soft tubes, and of unprotected gauze. Wicks of the form here presented were used. The simplest wick consists of a little roll of absorbent bichloride gauze, around which is wrapped a couple of thicknesses of Lister's protective oiled silk. The gauze protrudes a trifle from each end of the cylinder, and a few little holes snipped through the protective allow serum to reach the gauze elsewhere. In certain cases where injections through a tube are desirable the soft rubber tube can be surrounded with this wick. When a large gauze packing for the pelvis is needed, an apron of the silk can expand out over the gauze and protect against intestinal adhesions. The wick acts by capillary attraction; the silk wrap will not irritate the peritoneum and the whole thing is so soft that it adapts itself to curves readily, and I doubt if it will cause fæcal fistulæ. The end of a wick which

if each one lead up into a bunch of absorbent cotton or gauze. A little wick as big as a lead pencil will take pints of fluid out of the abdominal cavity and transfer it to the absorbent medium outside. When the wick is at work it is important for the patient to remain upon her back, for if intestines are not inflated with gas the fluid rises naturally to the anterior abdominal wall, instead of settling, as many surgeons suppose, in the region of Douglas' pouch. If the patient turns upon her side the fluid rising to the highest point will be out of reach of the wick. The relative positions of peritoneal exudation or of blood serum and intestines will vary with the amount of gas in the intestines, but ordinarily immediately after work upon abdominal contents it may be observed that all free fluid is rising toward the anterior abdominal wall, and that is why the little holes are snipped through the silk of the wick at various points.



Apron and wick.

My drainage tube No. 1, is still the intestine.

My drainage tube No. 2, is the wick, and this row of wicks at work in the pan of water is speaking more forcibly than I can to you who are observers.

133 W. 34th St.

projects at the external opening of the wound should be covered with enough absorbent cotton or gauze to hold all fluid that is coming from below. In the pan which I now fill with water a row of these wicks is introduced. And as you see, they empty the pan in a few moments by siphon action. They would empty it almost as quickly

PROF. REURERS, of Berlin, has used the cantharidate of potassium (Liebreich's remedy) in a severe case of diphtheria, with prompt and favorable results. Reurers was led to try the remedy because of its effects upon swollen and infiltrated tissues, believing that it might have a specific action upon the diphtheritic membrane. The favorable results in the single case in which it was tried will lead to further observations.

AN open competitive examination of candidates for junior assistant physician in any of the State hospitals and asylums, will be held at the office of the Civil Service Commission, Albany, N. Y., Thursday, August 20, 1891, commencing at 10 o'clock A.M. A candidate for the position must be a citizen of the State of New York, at least 21 years of age, and have had at least one year's experience in a hospital, or three year's experience in the general practice of medicine. For application blank, address the Secretary of the New York Civil Service Commission, Albany, N. Y.

JOHN B. RILEY, Chief Examiner.

FURTHER PROGRESS IN MEDICAL EDUCATION IN NEW YORK.—The Medical Department of the University of the city of New York makes certain special announcements this year which should have a very general interest, indicating as they do a decided advance in educational methods. First: The Faculty have placed the college upon a true university basis; that is, the pecuniary interests of the college have been put entirely in the hands of a body separate from the Faculty, while the latter receive fixed salaries, and are free to give their time and energy to advancing the standard of the curriculum unincumbered by financial care. This step makes the Faculty quite independent of the number of students who may attend the college classes.

A second change consists in making the three years' course obligatory; and a third, perhaps the most important of all, consists in the introduction of the recitation system in place of the didactic lecture during the first and part of the second year.—*Medical Record*.

A DOMESTIC STERILIZER.—There are few houses in which a ready sterilizer is not at hand, namely the kitchen oven. The heat which can be generated in this culinary appliance would be more than sufficient to destroy those forms of germ life which are inimical to wound treatment. With a clean receptacle at hand, into which towels and other appliances required for the purposes of an operation could be placed, the kitchen oven could be relied on to effect the necessary sterilization of these with convenience and dispatch. Thus as an improvised "sterilizer" we can easily conceive of the occasions when a surgeon would be glad of the assistance of the kitchen oven.—*Medical Press and Circular*.

PHYSICO-CHEMICAL RESEARCHES ON THE ALIMENTARY FEATURES OF MILK.—In an interesting communication to the *Journal de Médecine de Paris*, Jolly calls attention to the necessity of a due proportion of phosphate of lime in milk, in order that it shall be capable of maintaining nutrition. Milk, to properly nourish an infant, and supply a sufficient quantity of phosphate of lime for the purposes of ossification, should contain at least 1.25 G. of phosphate of lime per litre. The needs of the infant economy are abundantly provided for by normal human milk, which contains about 450 G. of mineral constituents per litre, of which about one-half, or 225 G., is phosphate of lime. He cites the following cases illustrating the foregoing:

First Observation.—A nurse, aged 23 years, had been delivered about three months before. She had nursed a child twenty days. At the beginning the child had gained between 13 and 19 G. Towards the twentieth day it was observed that it had lost 26 G. in two days, and 300 G. on the weight which it had at birth. The nurse was changed and the child improved. An analysis of the nurse's milk showed it to contain the fat, casein and sugar in nearly normal proportions, while the mineral salts were only 1.50 per 100, or about 0.75 G. of phosphate of lime per litre.

Second Observation.—The nurse, a Breton of 24 years,

of average height, well proportioned, appeared to enjoy perfect health. Her milk per 1,000 G. contained: casein 35.00; fat 43.30; milk sugar 51.80; mineral constituents 1.60. The child increased only about 7 G. per day, and at the end of three weeks, for several days, it lost 15 G. per day. The nurse was submitted to a phosphatic treatment. At the end of four or five days the child was seen to pick up, and after the eighth day gained regularly 20 G. per day. It need only be stated that the phosphate administered was not the phosphate of lime.

Third Observation.—The most feebly mineralized human milk which Jolly has met with, merits attention. Its composition per 1,000 was as follows: Casein 8; fat 74; milk sugar 54; mineral constituents 0.40. This milk, extremely rich in fat, was extraordinarily poor in casein and mineral salts. The nurse was an obese woman of 32 years. She had a freshness of complexion, and amplitude of form, which is generally considered as representing the very type of vigor and health. Like most persons who have a tendency to fatty degeneration, this woman used mostly farinaceous food for alimentation, to the exclusion of meat. It goes without saying that the child which she nursed sank steadily. Attention is called to this milk for the following reason: The physician is frequently called to assist families in the choice of a wet nurse, and he is generally contented with a physical examination of the milk. Now, in the case in question, the milk had a creamy and rich appearance which was certainly deceptive as to its nutritive value.

The phosphatic composition of the milk of the cow similarly undergoes considerable variations, dependent upon the quality of the food and the abundance of the lacteal secretion. While it is not uncommon to find milk containing 4 or 5 G. of phosphates, Jolly has met with a natural milk, not adulterated, which, while it contained the organic constituents in nearly normal proportions, had only 1.05 G. of the different phosphates per litre; that is to say, a quantity absolutely insufficient to serve usefully as a food for an infant.

The preceding examples are intended to show that the mineral richness of woman's milk, and cow's milk, are not always so great as some analyses seem to indicate; that the phosphatic richness of a milk has not only a considerable importance with reference to ossification in the child, but also as to its general growth.

In consequence, the determination of the phosphoric acid in milk must be made, before its nutritive value can be known.—*Journal de Médecine de Paris*.

A NEW private policlinical institute of some importance, and on a large scale, has just been opened in Berlin. It is to go by the name of the "Johanneum." The instruction is to combine hospital practice with clinical instruction and theoretical research. It contains eighty beds, is furnished with laboratories, microscope rooms, etc., an electro-mechanical institute, and a lecture theatre, in which courses are to be given by Professor Eulenberg on diseases of the nervous system; by Professor Zülzer on diseases of the kidneys and bladder; and by Dr. Scheimann on diseases of the nose and throat.

CALMATIVE FOR HYSTERIA.—

R. Chloral hydrat.
Sodii bromid., $\bar{a}\bar{a}$ 3j.
Ext. Hyoscyami, three-fifths gr.
Ext. cannabis indicæ, three-fifths gr.
Mucil. acaciæ, 3ij.

M. S. Dose, 2 to 4 drachms, every half to one hour, in a cup of orange-flower water. Specially useful for hysterical patients who complain of night terrors and insomnia. — Grassett, *La Méd. Moderne; Times and Register*.

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BY-LAW IV.—THE PUBLICATION OF PAPERS AND
REPORTS.

No report or other paper shall be entitled to publication in the volume for the year in which it shall be presented to the Association, unless it be placed in the hands of the Board of Trustees on or before the first day of July. It must also be so prepared as to require no material alteration or addition at the hands of its author.

Authors of papers are required to return their proofs within two weeks after their reception; otherwise they will be passed over and omitted from the volume.

Every paper received by this Association and ordered to be published, and all plates or other means of illustration, shall be considered the exclusive property of the Association, and shall be published and sold for the exclusive benefit of the Association.

The Board of Trustees shall have full discretionary power to omit from the published *Transactions*, in part or in whole, any paper that may be referred to it by the Association, or either of the Sections, unless specially instructed to the contrary by vote of the Association.

LONDON OFFICE, 57 AND 59 LUDGATE HILL.

SATURDAY, JULY 25, 1891.

ETIOLOGY OF TETANUS.

A recent communication by SANCHEZ-TOLEDO to the *Société de Biologie* of Paris, recalls this subject.

The first bacteriological work upon the etiology of tetanus was that of NICOLAÏER in 1884, who then described his earth bacillus, which has since come to be recognized very generally as the tetanus bacillus. NICOLAÏER found that tetanic symptoms followed the introduction under the skin of mice, rabbits and guinea pigs, of soil from streets and fields. In the pus which formed at the site of the inoculation the tetanus bacillus was found together with other microorganisms. NICOLAÏER did not obtain a pure culture, but KITASATO and others afterwards succeeded in producing pure cultures of this bacillus. The difficulties met by the earlier workers with this microorganism seem to have been due to their failure to recognize the anærobic character of the organism. It is now clearly established that the bacillus ceases to be virulent if exposed to oxygen.

In attempts to produce cultures of NICOLAÏER'S bacillus, other anærobic bacilli are usually found contaminating the cultures. Some of these ba-

cilli, like NICOLAÏER'S, are spore producing, but the spores of the tetanus bacillus appear earlier than those of any of the others. Now, since spores can withstand a temperature greater than that of the fully developed bacillus, the way was open to purify the culture by subjecting it to such a degree of heat as would destroy bacilli but not destroy the spores, at a time when the spores of the tetanus bacilli had made their appearance, and before the spores of the other organisms had developed. This method was elaborated by KITASATO, and pure cultures obtained.

It has been observed that the tetanus bacillus is to be found only in the immediate vicinity of the point of inoculation, and never in the blood or other tissues of the animal. This would seem to indicate that the effects were due to chemical products formed at the seat of inoculation.

Several years ago BRIEGER obtained from an impure culture of the tetanus bacillus a ptomaine which he called tetanine, and which, when injected into animals, particularly mice, produced tonic and clonic spasms of a tetanic type. Later, he extracted from the amputated arm of a man suffering with tetanus a ptomaine, apparently identical with his tetanine. More recently BRIEGER and FRÆNKEL have separated a toxalbumin from pure cultures of the tetanus bacillus, to which they have given the name tetano-toxine.

VAILLARD and VINCENT, in January, 1891, announced that pure, sporulated cultures of the tetanus bacillus, freed from their toxines, and injected in considerable quantities under the skin of susceptible animals, did not develop at the point of inoculation, nor produce tetanus. It seemed from their observations, that until the organism had grown for some time in an artificial culture medium, it was not capable of producing the disease, which was accounted for by finding that no poison was developed until some time after the organism had begun to grow, the production of this poison appearing to go on simultaneously with the formation of a peptonizing enzyme. A month ago, SANCHEZ-TOLEDO, having repeated the experiments of VAILLARD and VINCENT, reported his results to the *Société de Biologie*.

SANCHEZ-TOLEDO subjected pure cultures of the NICOLAÏER bacillus, in bouillon and gelatine, to temperatures of 70° C., 80° C., and even 90° C., for an hour, on a water-bath. At the same time,

he subjected to the same conditions control tubes containing filtrations from pure cultures of the bacillus, *i. e.*, solutions of the toxines, freed from the bacilli. Inoculations of considerable quantities of the contents of the control tubes produced no effect upon animals, proving the destruction of the toxines. Nevertheless, the pure cultures remained active, as the inoculation of one-half c.c. killed guinea pigs in twenty-four hours, and one-tenth c.c. killed mice in forty-eight to sixty hours, with tetanic symptoms.

He also secured cultures free from toxines by washing thoroughly with sterilized water through a Chamberland filter, after the manner adopted by VAILLARD and VINCENT. Ten c.c. of bouillon or agar culture was in this way washed with six to ten litres of water, and the remaining culture diluted with six c.c. of pure water. One-twentieth c.c. of this mixture inserted under the skin of mice caused death with tetanic symptoms in from forty-eight to eighty hours. One-fourth c.c. killed a guinea pig in less than eighteen hours with tetanic symptoms. In all the experiments the tetanus bacillus was found at the point of inoculation as was proven by microscopic examination, culture and inoculation. Moreover, it was found there in pure culture, without any other microorganisms, showing that tetanus could be produced by this organism without the intervention of any other form of bacterial life.

The disagreement, real or apparent, between the observations of SANCHEZ-TOLEDO and VAILLARD and VINCENT, awaits explanation.

We shall look forward with interest to the establishment of one or the other of these views, or to filling of the gaps by which they may be reconciled.

It can hardly be doubted, however, that Nicolaier's bacillus is a cause of tetanus, but the whole history of the germ shows that the conditions of its growth are as yet unknown, and probably are quite complex. It is a knowledge of these conditions which will give the predisposing causes of tetanus, and explain why, notwithstanding the wide distribution of this germ, that tetanus is so uncommon, and why tetanus sometimes makes its appearance in epidemic form, as it did in the United States in 1882, at which time the over-zealous newspaper reporter threw the blame on the toy-pistol.

TUBERCULAR INFECTION BY MILK.

DR. OLLIVIER, one of the physicians of the Hôpital des Enfants Malades, at Paris, has recently read a paper before the Academy of Medicine, on the dangers of milk-tuberculosis. He states that he was called upon to go to Chartres to consult concerning a case of tubercular meningitis. The patient was a young lady, aged 20, whose family history and personal antecedents were excellent, and whose hygienic surroundings were believed to be all that could be desired. But she had been placed at a small boarding school at Chartres, which, upon investigations proved to have been unusually afflicted by tubercular disease. During the preceding four years six out of thirteen scholars had successively or simultaneously become tuberculous; two of the cases having been *tabes mesenterica*. This was manifestly the place where the patient of DR. OLLIVIER had contracted her disease, which not long afterward resulted in death. An inquiry was instituted to ascertain the cause of this unfortunate series of cases, and it was found that the milk supply of the school had for some years been contributed to by a cow having a tuberculous udder; this cow had been brought every day to the convent to be milked and her milk had been consumed unboiled by the inmates. This non-boiling of the infected milk was held by DR. OLLIVIER to be the sufficient explanation of the series of cases at the school, and was made the basis of an argument in favor of the invariable boiling of milk, whose source has not been sanitarily proved to be free from tubercular contamination. In the discussion following the paper, DR. NOCARD stated that he had formerly expressed the opinion that all milk, from any unknown or suspected source, should be boiled before being used as food. But he now went further and advanced the necessity of a rule that no milk, whatever may be its source, should be consumed in the raw state. He related a case that had only a short time before come under his observation. He was called upon to examine the lymphatic glands of a calf, apparently in healthy condition, which, much to the surprise of its owner, had died after only a few days' illness. These glands were found to be full of tubercular bacilli. Not long after this discovery, the mother of the calf—a fine appearing animal, and the winner of several prizes at

shows—also died, and the udder, lungs and glands were examined and found to be tuberculous. And this is not by any means the first instance that handsome, prize-winning cows have been the unsuspected subjects of that disease. There is room here for much investigation as to the point at which the milk produced by these animals becomes dangerous by the conveyance of bacilli into the human alimentary canal, and what, on the other hand, are the elements in the human economy which grant immunity to such large proportions of exposed persons. Another line of investigation is also promised, in regard to qualities of condensed milk, which can hardly fail of interesting the profession, especially in those cases where the condensing factories are known to receive milk from dairies containing a number of tuberculous kine. This research is about to be undertaken by one or more of our own State Boards of Health.

LEGISLATION AGAINST THE IMPORTATION OF COMMUNICABLE DISEASES.

On April 1, a new Federal immigration law went into operation, whose ostensible purport is the shutting out of imported infectious disease, liable to be sent hither, from European ports, especially. The preliminary trials of the working of the new law have already been set in motion at the port of New York. Already there have been some cases of pulmonary tuberculosis and alopecia debarred from entry. Some little time will necessarily be spent in legal contest and opposition by the friends of indiscriminate immigration before the holding or effective properties of the law will be known. It is believed, however, that the act is sufficiently strong to prohibit some of the undesirable elements which under the old law were free to enter. One of the peculiar features of the new act is that it does not recognize an immigrant as landed until he has been passed by the Landing Bureau, of the Department of the Treasury. The steamship companies are thus made the custodians of all persons who are denied entry for physical reasons; and they become responsible for the care and maintenance of those persons so long as the importing vessel remains in port, and on her departure she must take away the rejected material. As a natural consequence some of the companies have

already advanced their rates for steerage traffic, which, of itself, will tend to purify the stream of immigration. Another salutary influence of the new law is that the steamship companies will become more cautious about the class of people they permit to come to this country on their vessels, and it may lead up to a preliminary physical examination by competent medical inspectors. When this good end shall have been accomplished, a very weak spot in our international relations will have been touched—a spot that has been repeatedly pointed out in our medical and sanitary contemporaries.

In British America, medical attention has been turned to the frequent importation of leprous cases, from Asia. Medical men have recently investigated such cases at Victoria, British Columbia, and have recommended that their increasingly rapid importation should be checked by legislation. It is stated that there has been a considerable spread of the disease during the last year in nearly all the Pacific cities of the Dominion, and has reached a point where its further advance must affect disastrously the prosperity of British settlements there.

IMMIGRATION AND PUBLIC HEALTH.

While our sanitarians and public health authorities are deeply concerned with the possible importation of some cholera infected rags or clothing containing the germs of small pox, it may be well to call their attention to another and very serious disorder affecting the public health.

The treasury bureau of statistics has recently made a report on immigration, from which we excerpt the following figures: The number of immigrants from 1789 to 1820 is estimated at 225,000. From that time the number for each decade is as follows: 1820 to 1830, 143,400; 1830 to 1840, 599,100; 1840 to 1850, 1,713,200; 1850 to 1860, 2,598,200; 1860 to 1870, 2,466,700; 1870 to 1880, 2,944,600; 1880 to 1890, 5,176,200.

It scarcely needs comment to show the enormous influence that such a vast mass of immigration has upon the health, welfare and prosperity of this country. A number equal to one-twelfth of the entire population of the United States, and equal to the population of the great State of Pennsylvania, added to this country in a single decade! It is a notorious fact that the

quality of this vast stream of humanity has diminished with each decade, and in just about geometrical ratio with its increase in numbers. What a change from the days when men set out across the seas to escape persecution or to secure wider civil and religious liberty, to the time of "assisted" immigration, when men leave their country not for their own good, but the good of their neighbors. Can we estimate the amount of crime, ignorance and insanity that will be inflicted upon this country in the defective descendants of these wretched beings?

Every town of any considerable size in Europe has at least one agent of a steamship company who are industriously circulating false stories regarding the rates of wages in this country and the ease with which employment is obtained. These agencies, together with the influence of relatives already living in this country, and the "assistance" freely given by local officers to undesirable persons, has pushed the annual increment to enormous proportions. The absorption of such a mass of reputable and fairly well-to-do persons would severely tax the resources of even this great country, but what shall be done with this vast mass, when the majority are found to be mentally, morally and physically far below the average of mankind?

In our opinion, it is none too soon to grapple with this great problem. Already the public service of our large centers of population are beginning to struggle under the vast mass of criminality, pauperism and insanity poured into this country from the continent of Europe.

Recently the proposition to add a medical officer to the cabinet has been freely discussed, and much has been said pro and con. To our mind, the urgent need of such an officer is shown if he is to deal with no other subject than that of immigration, a question fraught with mighty consequences to this nation, and beside which questions of war, famine and trade sink into comparative insignificance.

CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS.

This body is constituted of the several specialty organizations of this country; and convenes once in three years in Washington. The next meeting will be held in that city September 22, 23, and 24.

These societies embrace in their membership many of the leading and most enthusiastic investigators and observers in our profession. In addition to the triennial Congress each of these societies hold an annual meeting, where papers are read, notes compared and a résumé of the year's progress is compiled for publication in handsome volumes. Unfortunately these volumes of transactions are issued in quite small editions and in distribution rarely reach beyond the limited membership of the several societies.

We are glad to note that very many of the members of these organizations are also active members of the American Medical Association. We rejoice at their affiliation, for they are the men who are best known to the great body of general practitioners; they are the men who realize most fully the value of society work, of communion one with another. This gathering of men engaged in diverse pursuits, but still members of our profession, is beneficial to all. It broadens the mind of every man who attends the meeting, and as their work is reflected through the journals, does good to every practitioner.

It is frequently charged that specialists are narrow in their views, that everything pertaining to their chosen department is magnified at the expense of the whole. The men who attend general gatherings of members of the medical profession are not the ones afflicted with obliquity of vision. They know that personal contact and observation will often change an opinion.

The social enjoyments of these occasions go far in lightening the drudgery of practice. Each meeting is remembered as one of the green spots in professional life. Attendance pays in length of days, lessening of wrinkles and improvement of digestion.

THE ARIZONA CLIMATE IN WINTER FOR INVALIDS.

DR. G. S. LIGGETT, of Oswego, Kan., writes to the *New York Medical Journal* concerning the climatic conditions of a part of Arizona which was visited by him during the winter of 1890-91. He spent most of his time at a point about forty miles distant from Tucson, in the foot-hills of the Catalina Mountains, and he reports that he found there conditions and qualities that commend themselves to consumptives and other invalids. He says: "For an outdoor winter climate

I do not think that the region can be beaten, and high up in the mountains there are magnificent places for summer resorts, and the time ought not to be far distant when our physicians will send their patients westward rather than 'across the pond' for a change of climate and scenery." He took thermometric observations from October to and nearly through the month of January, 1891, and he prints the record in full for the benefit of physicians. There was only one cold snap, occurring in the middle of January and lasting only three days. The wind from the snow clad mountains was at times quite cool. The hardest rains were in the night-time, and there was one little flurry of snow. They had three rain storms during the three months, but it was only during the time the rain was falling that the invalids needed to remain indoors. Thousands of song-birds have their winter quarters there. The party was housed at a ranch forty miles, by stage-route, from the railroad and up among the live-oaks. Their supplies included the choicest of mutton and beef, and abundance of fresh vegetables all winter, seasoned with an appetite that could enjoy everything that came before it. They aimed to lead an exclusively out-of-door life, walking, riding and hunting. The roads were excellent, and game—as quail, antelope, deer, coyote and wild hogs—was plentiful. There was no dampness nor sign of mold anywhere. The soil was so dry that the occurrence of rain was a decided advantage to the roads. The hours of sunshine were many, but no proportionate record of their number has yet been taken. The scenery is variously attractive, with views of *mesa*, foothills, mountains, valleys and cañons, and there was no lack of interesting objects to visit and engage the mind and attention of an invalid who was desirous of passing his time in the open air.

THE ISLAND OF ST. KILDA.—A cablegram from London, July 21, 1891, to the daily papers, calls attention to a mysterious malady which is affecting new-born infants on the little island. It says:

"The symptoms of the disease appear about the eighth day from birth. The hands close and remain rigid; a kind of lockjaw follows; the muscles of the face contract; the mouth is closed, and in a few hours more death ensues. From the appearance of the first symptoms until dissolution, twenty-four hours elapse. One family have lost twelve children in this way, and all the families on the island have lost from two to eight children by the singular disease. The first-born of each family generally lives. The doctors are inclined to attribute the malady

partly to the habit among the islanders of intermarrying among blood relatives, and partly to the fact that the diet of the people is limited almost entirely to oily food, such as birds and fish. There are only about 100 people on the island, and they are so closely related as to really form hardly more than one large family."

This condition of affairs has long been known on St. Kilda. The influence of the intermarrying, however, is negatived by the fact that children of the natives of St. Kilda born elsewhere than on the island, do not become affected with trismus neonatorum.

According to Holland, trismus neonatorum prevails so extensively on the island of Heimaey, one of the Icelandic group, that the population is maintained almost entirely by immigration.

On this island, as at St. Kilda, the diet is almost exclusively one of fish and sea birds, and the custom prevails of feeding the infants this strong and oily food soon after birth. When, in addition to this fact, the remarkable uncleanness of the natives is recalled, we may certainly be justified in supposing the cause of the tetanus to be in a poison contained in the food.

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

An official record of the four executions by electricity at Sing Sing prison on July 7th, has now been published, and it fully confirms the correctness of the first newspaper reports as to the admirable manner in which they are conducted and the instantaneousness and painlessness with which death was in each instance produced. In accordance with the provisions of the new statute the warden of Sing Sing has sent to the county clerk formal certificates of the four executions accompanied by a report of the observations of Dr. Carlos F. MacDonald, President of the State Commission on Lunacy, and Dr. Samuel B. Ward, of Albany, who served as the official physicians at the executions.

In their report the physicians state that all of the condemned walked into the execution-room unaided, with firmness, and without assistance, quietly seated themselves in the electric chair and submitted without resistance to the adjustment of the retaining straps and electrodes; that in each instance unconsciousness was produced instantaneously by the closure of the circuit, was complete, and persisted without interruption until the heart's action had entirely ceased and death had certainly occurred; and, thirdly, that an autopsy was made in each instance as soon as practicable by Dr. Ira T. Van Gieson, of New York, under their supervision, with the result of revealing the same gross changes in the blood and tissues previously observed in cases of death by the strong electric currents. They then stated that specimens, especially of the blood and of the nervous system, were procured for microscopic examination, the results of which would be presented as soon as the examinations were completed.

In conclusion they congratulate the warden on the completeness in all their details of all the preliminary arrangements, on the uniform good order and decorum, which prevailed during the trying ordeal, and on the resulting demonstration of the rapidity and painlessness of this method of inflicting the death penalty. "The experience of to-day," they say, "has proved to our satisfaction that this method is superior to any other yet devised."

The grand jury has made an appeal for a change in the condition of the inmates of the city asylum for insane females on Blackwell's Island, which certainly ought to be heeded by the authorities, and it is to be hoped that the Board of Estimate and Apportionment will now provide for the urgent necessities of the case. For a long time past this institution has been greatly overcrowded, so that 1,700 women have been huddled together in buildings originally intended for 1,200 at the outside. While there is urgent need for repairs and improvements in the buildings on Blackwell's Island, it would seem far wiser, rather than to increase the capacity of these buildings, to make suitable provisions for the overflow at the city's farm for the insane which was established a few years ago at Central Islip, on Long Island, a very salubrious rural district situated midway between the ocean and Long Island Sound, and which has thus far proved a very successful experiment.

Dr. Wm. J. Morton, the well-known specialist in diseases of the nervous system, has expressed the hope that the city of New York may at some future time have all its insane cared for in some such manner as at the colony for the insane at Gheel, in Belgium. "There," he recently said, "the picture is unlike anything to be seen in America or elsewhere in Europe, and therefore valuable for its contrasts and its suggestions. It is unusual to see the insane living their lives in natural surroundings. Gheel teaches us the possibilities that exist in the treatment of the insane. It shows us that they will work cheerfully if well managed, and that they may be treated, under proper precautions, with great liberty, and not abuse it. It teaches us, moreover, how woefully wide our advanced civilization is from the mark it might attain to in the treatment of insanity.

"The new and stringent immigration laws, providing for the examination and return on the vessels which brought them of all pauper and diseased emigrants landing in this country, have not gone into effect any too soon. For years it has been notorious that such dependent persons have been shipped to the United States by municipal authorities and so called benevolent societies in the old world; and during the past seven years the New York State Board of Charities has returned to their homes in Europe no less than 1,374 permanently disabled and helpless alien paupers who had been sent here to become a burden upon the tax-payers of this State. In the reports of the Board, these 1,374 persons are divided into the following classes: Lunatics, imbeciles, feeble-minded, vagrant and disabled, decrepit, cripples, blind, epileptic, paralytic, deaf-mutes, and otherwise infirm. The cost of removing these persons from this State to their homes in Europe ranged from \$2,451 to \$6,708 per

annum, but it is probable that in no other way could the Board have saved more for the people of New York. Said the Board in its report for 1890:

"Estimating the duration of life of this class of dependents, had they been allowed to remain in this country, at the minimum average of fifteen years, an ultimate saving of \$2,427,360, independent of the expense of housing them and providing salaried officers for their care-taking, is definitely proved, and an illegitimate burden on our people is thrown back where it originated, and where it justly and naturally belongs.'"

According to the bulletin of the New York State Board of Health, the mortality in this State in the month of April was the largest ever recorded. This increase was due to the epidemic of influenza, the deaths from which numbered nearly 5,000. The total number of deaths was 13,981, or 1,500 greater than in January, 1890, when the largest number of deaths ever reported up to that time for one month was recorded. This represents an annual death rate of 30 per 1,000 of the population.

One night, not long since, a man was brought to Bellevue Hospital with a slight wound over one eye, and in a state of unconsciousness, which was believed to be due to intoxication. The next day, however, he died. It was learned that he had been stabbed in the eye with an umbrella, and the autopsy showed that the ferrule had penetrated nearly three inches into the brain, producing fatal hæmorrhage.

P. B. P.

New Surgical and Pathological Society.

Getting the Hospital and Ambulance Service in Readiness for the Meeting of the Grand Army of the Republic.

To the Editor:—The profession in Detroit are at present interested in making arrangements for the medical and surgical care of the veteran soldiers who meet in this city early in August. A committee composed of representative practitioners, under the chairmanship of Dr. E. L. Shurly, have the work in charge. They have divided the city into ambulance districts, established medical relief stations at intervals along the line of march, and gotten the hospitals into special condition for the reception of the old soldiers who may happen to be taken sick or be injured while here. The demands of irritable bladders and prostates are to be particularly looked after by the erection of a large number of latrines where they will be most accessible. It is said that in some cities which have been crowded during the meeting of the G. A. R., much suffering has resulted from the neglect to erect proper conveniences. The medical men of Detroit will spare no pains to make the reunion of the soldiers successful and pleasant.

A new medical society has been organized here. It is known as the Michigan Surgical and Pathological Society. It adopts the Code of the American Medical Association, and has for its object the encouragement of surgical and pathological research, and the maintenance of a museum of gross pathology—a department of knowledge which many doctors in Detroit and Michigan think has been neglected, and has suffered by the greater en-

couragement which has been given to microscopical research.

Dr. Hal C. Wyman is the President, Dr. Lewis E. Maire, Vice-President, Dr. W. R. Scurr, Secretary, Dr. Wm. J. Hamline, Treasurer, and Drs. F. S. Hough and R. S. Linn, Curators. The presentation to the Society of a pathological specimen is a requisite for membership. A cash prize will be given once a year for the best original paper on some surgical or pathological topic.

X.

Detroit, July 28, 1891.

NECROLOGY.

Frank Hamilton Potter, M.D.

Dr. Frank Hamilton Potter, of No. 273 Franklin street, Buffalo, died July 16, after an illness of ten days' duration.

He was the only son of Dr. William Warren Potter, of 284 Franklin street, and was born in Cowlesville, Wyoming county, January 8, 1860, being in his thirty-second year at the time of his death. In 1882, when he was twenty-two years of age, he was graduated from the Buffalo Medical College. Prior to this time he had served as resident physician in the Rochester City Hospital for two years. In 1883, at the organization of the Niagara University, he was appointed clinical assistant to the chair of surgery, and subsequently held the position of lecturer in anatomy and laryngology. He at one time was a member of the surgical staff of the Sisters of Charity and Emergency hospitals. He first began the practice of general medicine, which he continued for a time, but afterward gave it up for the special field of laryngology, for which he had fitted himself in the schools of both this country and Europe. But recently he was appointed clinical professor of laryngology of the University of Buffalo. He was also associate editor of the *Buffalo Medical and Surgical Journal* with his father. He was a member of numerous medical societies, among which were the Buffalo Medical and Surgical Association, Erie County Medical Society, Medical Society of the State of New York, Buffalo Pathological Society, and Obstetrical Society. He was also a member of the Saturn and Thursday clubs. During the year 1890 he was secretary of the Laryngological Society of the American Medical Association, and he was recently chosen by the council of the American Laryngological Association for membership in that organization.

In political life he had taken a small part, having served two terms as civil service commissioner. He was removed from that office by Mayor Becker, along with Mr. Loomis, but was reinstated when Mayor Bishop was elected. This office he resigned about a year ago, on account of other business duties.

In 1887 he was married to Eva, daughter of Lars G. Sellstedt. To them two children were born, both of whom, with his wife, survive him. He was an active and hard-working member of his profession, and had until recently enjoyed the best of health. A week ago last Sunday he was taken ill, but was not compelled to take to his bed until Wednesday. It was then found that he was suffering from an enlargement on one side of the abdomen. On Saturday a surgical operation was performed, at which time nearly six ounces of pus were taken from the region of the colon. Blood poisoning had set in, and he failed rapidly, dying July 16.

DR. JOHN F. GROENEVELT, of New Orleans, and an Assistant Surgeon in the Marine Hospital Service, at the quarantine station at Chandeleur, died of yellow fever on June 29. The disease was probably contracted by the deceased in the course of his official duty, while he was inspecting a steamer from Brazil. He had already seen quarantine service at the Cape Charles and at the South Atlantic stations. He was a graduate from the Tulane University in the class of 1889, and was regarded as a young surgeon of talent and great promise.

It was believed at the Bureau that he was fully acclimated by having had the yellow fever, and the detail is understood to have been made at his own suggestion.

This is the fifth officer of this service that has perished from this disease in the last decade.

DR. JOSEPH PAYNE LOGAN, of Marietta, Georgia, died June 2, in the seventy-first year of his age. He was one of earlier vice-presidents of the American Medical Association, having held that office from 1860 to 1863. He was a Virginian by birth, was educated at Washington College, in State of nativity, and graduated in medicine from the University of Pennsylvania, in 1841. He practiced for a brief period at Baltimore, but made Atlanta the permanent field of his professional life. He was appointed Professor in the Atlanta Medical College, of the departments of Physiology and Principles of Medicine. He also edited the *Medical and Surgical Journal* of that city. He had been president of the Georgia Medical Association and of the Atlanta Academy of Medicine. He was for a time a member of the State Board of Health, in which capacity he contributed several valuable reports upon yellow fever and other epidemic diseases.

PROFESSOR F. W. SCANZONI died at Berlin, on June 13, in his seventy-first year. He was the well-known Professor of Obstetrics and Diseases of Women at the University of Würzburg, and author of one of the best of the pioneer "Lehrbuchs" on the sexual organs of women.

BOOK REVIEWS.

ST. THOMAS HOSPITAL REPORTS. New Series, Vol. xix. Edited by DR. HADDEN and MR. ANDERSON. Pp. 463, 8vo, cloth. London: J. and A. Churchill. 1891.

This handsome volume is not inferior to any of its predecessors—the actors may indeed change, but the stage, its wings, entrances and exits, and the shifting audience remain the same. The old story is retold, and interestingly too, of the great charitable work performed by this magnificent hospital, but it is the scientific portion of the book that will have the greatest interest for American readers. The first essay is one on the influenza epidemic of 1890, by H. P. Hawkins, M.R.C.P., which, although occupying 22 pages, the author has summarized in a single paragraph as follows:

“I believe, however, that we have gleaned nothing from this epidemic, save a more accurate knowledge of the rise of temperature, which we owe to the use of the clinical thermometer, and that we know less of the cause and origin than in the case of any other specific fever.”

Fifteen hundred cases of influenza were seen by the St. Thomas' staff, and their records are utilized in this paper.

Mr. Mitchell Clark reports a case of total transverse lesion of the cord, upper dorsal region, in which the patient survived the injury ten months. After a painstaking necropsy, fully set forth, he concludes by saying “that in cases of lesion in the upper part of spinal cord, there must be retained some connection of its lower parts with the intercranial centres, even when sclerosis of the pyramidal tracts is present, in order that muscular rigidity and increased tendon reflexes may occur,” which is a distinctly John Bull method of stating a proposition, but clear, if one will reformulate it with the same terms.

Dr. Robinson presents a tabulated report, with an analysis, of all the cases of radical cure of non-strangulated hernia from 1879 to 1890—numbering 64. The favorite operation, as shown by the record, was that of Mitchell Banks, and the results show that 43 of the cases operated on, subsequently communicated with, replied to the inquiries sent; of 18 cases of congenital herniæ, 14 replied, and all of these were “cured;” of 11 cases of funicular herniæ 8 replied, and all of these were “cured;” of five cases of femoral herniæ all replied, three were cured and two relapsed; of 22 cases of acquired inguinal herniæ, there were 14 replies, of these nine cases were cured, and five relapsed. It therefore appears from these statistics, that a much greater number of the congenital cases were cured than of those having acquired hernia. The mortality was 4 out of 64 cases. He clearly points out the dangers of removing large sacs *in toto*, and urges

that such sacs be divided high up, and the lower portion allowed to remain in the tissues unconnected with the abdomen.

Sir Wm. McCormac, in another part of the volume, gives his views on the subject, and thus concludes: “That in a large proportion of cases of inguinal hernia, especially those of congenital origin, a radical cure is possible, and that in femoral and umbilical herniæ of small or moderate size, the prospects of cure are good. Even where an absolute cure is not accomplished, a great gain is generally secured in the diminution of the hernial aperture, by which the retention of the hernia within the abdominal cavity becomes more practicable. Lastly, and most importantly, the operation, when properly performed, is scarcely dangerous to life.”

There is a timely article by Mr. Leonard A. Bidwell, on the treatment of erysipelas by hypodermatic injection, and an interesting report by Dr. Cullingworth, of the In-Patient Department for Diseases of Women. Most interesting to physiologists is the report by Dr. Hadden and Mr. Ballance of the experimental observations on the brain of the monkey. These experiments were designed to show the effect *seriatim* of stimulation of the different convolutions, and were conducted at the Brown Institution, under the terms of a grant toward the expenses of the research by the Scientific Grants Committee of the British Medical Association. There is also an analysis of 708 cases of pneumonia by Dr. Hadden and others, and a very interesting account of forty-one fatal cases of osteo-myelitis by Mr. Mackins and Mr. Abbott, but our waning space admonishes that we must close our review of this volume, and in justice say to our *confrères*, “Well done! thou good and faithful.” J. B. H.

HEREDITY, HEALTH AND PERSONAL BEAUTY.

By John V. Shoemaker, A.M., M.D., Professor of Materia Medica, Pharmacology, Therapeutics and Clinical Medicine, and Clinical Professor of Diseases of the Skin in the Medico-Chirurgical College of Philadelphia, etc. Phila. and London: F. A. Davis. 1890. Price, \$2.50.

Dr. Shoemaker has here given forth a work which may appeal to both the professional and lay mind; that is, it can be well understood by the intelligent non-professional, while much of its subject matter may well appeal to the physician. It may almost be termed a “popular science” treatise, and as such, will no doubt find welcome and an opportunity to do good. Dr. Shoemaker has certainly had a large experience, which admirably fits him for the proper handling of his theme. The book is pleasantly written, and is a credit to the publisher as well.

MISCELLANY.

AMERICAN ORTHOPÆDIC ASSOCIATION.—The fifth annual meeting of the American Orthopædic Association, will be held in the new reception room of the Arlington Hotel, Washington, D. C., September 22, 23, 24 and 25, 1891.

The office of registration of the Congress of American Physicians and Surgeons will be at the Arlington. The Association will be called to order daily at 9 A.M. Recess from 12 to 12.30 P. M. Adjournment at 2 P. M., or in time for the meeting of the Congress at 3 P. M. Exhibition of apparatus at the close of each day.

First Day—Tuesday.

1. The President's Address, Dr. A. B. Judson, New York.
2. The Orthopædic Work of the late Mr. Thomas, Dr. A. J. Steele, St. Louis.
3. Uniform Nomenclature in Orthopædic Surgery, Dr. W. R. Townsend, New York.
4. Two Cases of a Peculiar Type of Primary Crural Asymmetry, Dr. Henry Ling Taylor, New York.
5. On the Best Means of Preventing a Loose Joint, or Dangling Limb, after Resection at the Shoulder-Joint, with an Illustrative Case, Dr. W. R. Whitehead, Denver.
6. A Case of Spina Bifida with Partial Motor and Sensory Paralysis, Double Equino Varus and Purulent Bursitis, Dr. H. Augustus Wilson, Philadelphia.
7. Congenital Club-Foot, with Absence of Great Toe and Continuous Bones of the Instep, Dr. T. M. L. Chrystie, New York.
8. A Case of Club-Foot, Club-Hand and Multiple Joint-Deformity, Dr. William E. Wirt, Cleveland.
9. On the Use of the Wrench in the treatment of Club-Foot, Mr. Robert Jones, Liverpool.
10. Operation upon the Concave Surface in Talipes Equino Varus, Dr. B. E. McKenzie, Toronto.
11. The After Treatment of Excision of the Knee-Joint, Dr. John C. Schapps, Brooklyn.
12. Gonorrhœal Rheumatism and its Treatment; Primary and Secondary, Mr. B. E. Brodhurst, London.
13. Atrophy in Joint Disease, Dr. E. G. Brackett, Boston.
14. The Diagnostic and Prognostic Value of High Temperature in Chronic Joint-Disease, Dr. Robert W. Lovett, Boston.
15. On the Tests for Recovery from Joint-Disease, Mr. Robert Jones, Liverpool.
16. Apparatus for Making Traction, Dr. William E. Wirt, Cleveland.
17. Some Lateral Traction Fixation Hip Splints, Dr. A. M. Phelps, New York.

Second Day—Wednesday.

18. Rachitis in Adolescence, Dr. Bernard Bartow, Buffalo.
19. The Aspirator in Orthopædic Practice, Dr. Ap Morgan Vance, Louisville.
20. Congenital Misplacement of the Hip, with New Apparatus for its Treatment, Dr. A. M. Phelps, New York.
21. A Study of Atrophies, Dr. Roswell Park, Buffalo.
22. The Diagnosis of Pott's Disease, Dr. Robert W. Lovett, Boston.
23. The Differential Diagnosis in Pott's Disease, Dr. Geo. W. Ryan, Cincinnati.
24. Syphilitic Pott's Disease in Children, Dr. John Ridlon, New York.
25. Pott's Disease and Pregnancy, Dr. T. Halsted Myers, New York.
26. Paraplegia in Pott's Disease, Dr. E. G. Brackett, Boston.
27. Pressure-Myelitis in Pott's Disease, Dr. Albert Hoffa, Wurzburg.

28. Abscesses in Pott's Disease, Dr. Herbert L. Burrell, Boston.
29. Abscesses in Pott's Disease, Dr. W. R. Townsend, New York.
30. The Evacuation of Spinal Abscesses without Drainage, Mr. George Arthur Wright, Manchester.
31. Bilateral Lumbar Abscess, with a Case, Dr. James K. Young, Philadelphia.
32. The Benign Course of Abscesses in Pott's Disease under Efficient Mechanical Treatment, Dr. Newton M. Shaffer, New York.
33. The Value of Mechanical Treatment in Old and Neglected Cases of Pott's Disease, Dr. Henry Ling Taylor, New York.
34. The Mechanical Treatment of Pott's Disease, with an Exhibition of Apparatus, Dr. A. M. Phelps, New York.

Third Day—Thursday.

35. Malignant Disease of the Vertebrae Simulating Pott's Disease, Dr. A. B. Judson, New York.
36. Paralysis in Pott's Disease, Dr. Charles L. Scudder, Boston.
37. Prognosis in Pott's Disease, Dr. Samuel Ketch, New York.
38. Proposed Treatment of Pott's Disease by Wiring the Vertebral Processes, Dr. B. E. Hadra, Galveston.
39. The Operative Treatment in Spinal Caries, Dr. De Forest Willard, Philadelphia.
40. The Treatment of Pott's Disease with Especial Reference to the Early Stage, Dr. Bernard Bartow, Buffalo.
41. Pott's Disease in Adults, Dr. A. J. Steele, St. Louis.
42. Pott's Disease in Middle and Advanced Life, Mr. Howard Marsh, London.
43. Cervical Spondylitis, Dr. L. A. Weigel, Rochester.
44. The Prevention of Unnecessary Deformity in Pott's Disease, Dr. Royal Whitman, New York.
45. A Brief History of the Use of Suspension in Pott's Disease, Dr. Benjamin Lee, Philadelphia.
46. Recumbency in Pott's Disease, Dr. Ap Morgan Vance, Louisville.
47. Extension in Pott's Disease, Dr. B. E. Kenzie, Toronto.
48. Extension in Bed, Dr. Charles C. Foster, Cambridge.
49. Traction and Fixation in Pott's Disease, Dr. Reginald H. Sayre, New York.
50. The Treatment of Pott's Disease, Dr. V. P. Gibney, New York.
51. Comparative Value of the Present Modes of Treatment of Caries of the Spine, Dr. E. H. Bradford, Boston.

Fourth Day—Friday.

52. A Further Contribution to Typhoid Spine, Dr. V. P. Gibney, New York.
53. The Treatment of Congenital Dislocations of the Hip, Dr. E. H. Bradford, Boston.
54. On Elongation of the Ligamentum Patellæ as a Factor in the Production of Certain Knee Troubles and Difficulties in Locomotion, Dr. Newton M. Shaffer, New York.
55. Observations on Torticollis, with Particular Reference to the Significance of the So-called Hæmatoma of the Sterno-Mastoid Muscle, Dr. Royal Whitman, New York.
56. Ten Cases of Excision of the Knee Joint for Disease, and their Lessons, Dr. Joseph D. Bryant, New York.
57. Rheumatic Spondylitis, Dr. George W. Ryan, Cincinnati.
58. The Definition and the Scope of Orthopædic Surgery, Dr. V. P. Gibney, New York.
59. The Relations of Lateral Curvature of the Spine, and Flat-foot, Dr. Paul Redard, Paris.
60. Pathological Anatomy of Lateral Curvature of the Spine, Dr. F. Beely, Berlin.
61. Means of Recording Rotation in Lateral Curvature, Dr. E. H. Bradford, Boston.

62. A Contribution to the Etiology of Lateral Spinal Curvature, Dr. Charles L. Scudder, Boston.

63. Modifications in the Treatment of Lateral Curvature, Dr. E. H. Bradford, Boston.

64. Spastic and Infantile Paralyzes, Dr. De Forest Willard, Philadelphia.

65. The Operative Treatment of Spastic Paralysis, Dr. L. A. Weigel, Rochester.

66. The Operative Treatment of Spastic Paralysis, Dr. Charles L. Scudder, Boston.

67. Additional Notes on Sacro-Iliac Disease, Dr. Benjamin Lee, Philadelphia.

Officers.—President, A. B. Judson, M.D.; Vice-Presidents, Ap Morgan Vance, M.D., George W. Ryan, M.D.; Corresponding Secretary, Samuel Ketch, M.D.; Secretary and Treasurer, John Ridlon, M.D., 337 W. 57th St. New York; Committee on Membership, E. H. Bradford, M.D., Arthur J. Gillette, M. D., Samuel Ketch, M.D., Benjamin Lee, M.D., L. A. Weigel, M.D.

AMERICAN DERMATOLOGICAL ASSOCIATION.—The fifteenth annual meeting will be held at the Shoreham Hotel, Washington, D. C., September 22, 23, 24 and 25, 1891.

First Day. Tuesday, September 22, 1891.

Business meeting (with closed doors) at 9:30 A.M. Report of Council. Nomination of Officers for the ensuing year. Appointment of Auditing Committee. Proposals for Active and Honorary Membership. Miscellaneous Business.

Morning Session at 10:30 o'clock. Report of Committee on Nomenclature, and discussion thereon.

Papers:

1. Dermatitis Hæmostatica, Dr. H. G. Klotz.

2. A Case of Lupus Erythematosus with Fatal Complications, Dr. W. A. Hardaway.

3. Report of a Case of Universal Erythema Multiforme, with colored portrait and specimen, Dr. L. A. Duhring.

4. An Unusual Case of Sarcoma involving the Skin of the Arm; Amputation; Recovery, Dr. F. J. Shepherd.

5. Multiple Sarcoma. History of a Case, showing Modification and Amelioration of Symptoms with large Doses of Arsenic, Dr. S. Sherwell.

Second Day. Wednesday, September 23, 1891.

Business Meeting (with closed doors) at 9:30 A.M. Report of Treasurer and Auditing Committee. Election of Officers. Election of Active and Honorary Members. Selection of Time and Place of next Meeting. Miscellaneous Business.

Morning Session at 10:30 o'clock. Report of Committee on Statistics.

Papers:

Discussion on Tuberculosis of the Skin:

6. Its Clinical Aspects and Relations, Dr. J. C. White.

7. Its Pathology, D. J. T. Bowen.

8. Its Treatment, Dr. G. H. Fox.

9. Thirteen Cases of Tuberculosis of the Skin, with their Treatment, Dr. J. S. Howe.

10. A Case of Lichen Scrofulosorum, Dr. J. Grindon.

11. Notes of a Visit to the Leper Hospital at San Remo, Italy, with Photographs, Dr. L. A. Duhring.

Third Day. Thursday, September 24, 1891.

Morning Session at 9:30 o'clock.

Papers:

12. The Treatment of Alopecia Areata, Dr. P. A. Morrow.

13. A Therapeutic Note on Alopecia Areata, Dr. L. D. Bulkley.

14. Morphia Atrophica of Wilson, Dr. R. W. Taylor.

15. The Treatment of Pruritus, Dr. E. B. Bronson.

16. Prairie Itch, Dr. L. N. Denslow.

17. Diseases of the Skin associated with Derangements of the Nervous System, Dr. W. T. Corlett.

18. Treatment of Chronic Ringworm in an Institution for Boys, Dr. L. A. Dulring.

Fourth Day. Friday, September 25, 1891.

Morning Session at 9.30 o'clock.

Papers:

19. Notes of a Case of Acute Dermatitis Exfoliativa, Dr. J. E. Graham.

20. Note Relative to Pemphigus Vegetans, Dr. J. N. Hyde.

21. A Study of Myosis Fungoides, with Report of a Case, Drs. H. W. Stellwagen and H. Leffingwell Hatch.

22. Lymphangioma Circumscriptum, with Report of a Case, Dr. M. B. Hartzell.

23. Remarks on Carbuncle, with Report of a Peculiar Case, Dr. H. G. Klotz.

24. Note on Erythema et Nævus Nuchæ, Dr. C. W. Allen.

25. A Case of Lichen Ruber, Dr. J. H. Grindon.

26. The Personal Equation in Dermatology, Dr. L. D. Bulkley.

Retirement of old officers and induction of those newly elected.

Officers for 1891: President, F. R. Greenough, M.D., of Boston. Vice President—L. N. Denslow, M.D., of St. Paul. Secretary and Treasurer—George Thomas Jackson, M.D., of New York.

THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION will hold its first annual meeting at the Hall of the College of Physicians, cor. Locust and Thirteenth Sts., Philadelphia, Pa., Thursday, Friday and Saturday, September 24, 25, and 26, 1891, under the Presidency of Dr. G. Betton Massey.

Physicians interested in the discussion of electricity in medicine, are invited to attend without further notice.

WM. H. WALLING, M.D., Secretary,
2005 Arch St., Philadelphia.

HORATIO R. BIGELOW, M.D.,
Chairman Executive Council.

JOSEPH O'DWYER, M.D., LL.D.—At the Commencement of St. John's College, Fordham, in June of this year, the honorary degree of Doctor of Laws was conferred upon Dr. Joseph O'Dwyer, of this city.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from July 11, 1891, to July 17, 1891.

Col. Charles Page, Surgeon, heretofore assigned to duty in the Division of the Atlantic, will report to the commanding General, Dept. of the East, for assignment to duty as Medical Director, and Lieut. Col. Charles T. Alexander, Surgeon, will report for assignment to duty as attending surgeon, New York City.

Asst. Surgeon A. B. Banister, U. S. A., granted leave of absence for fourteen days.

Major Ely McClellan, Surgeon, heretofore assigned to duty in the Division of the Missouri, will report to the commanding General, Dept. of the Missouri, for assignment to duty as attending surgeon, Hdqrs. Dept. of the Missouri, and examiner of recruits at Chicago, Ill.

Surgeon Bernard J. D. Irwin, U. S. A., relieved from duty at St. Louis, Mo., and ordered to Chicago, Ill., for duty as Medical Director, Dept. of the Missouri.

Asst. Surgeon Paul R. Brown, U. S. A., leave of absence extended one month.

Asst. Surgeon John J. Cochran, U. S. A., leave of absence on surgeon's certificate of disability extended three months.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending July 18, 1891.

P. A. Surgeon L. W. Atlee, ordered to the "Independence." James Shirley Hope, appointed an Asst. Surgeon in the Navy from July 10, 1891.

Surgeon Wm. Martin, detached from duty at the Marine Rendezvous, San Francisco, Cal., and from special duty in that city and granted leave until September 15, and then to be placed on waiting orders.

P. A. Surgeon M. H. Crawford, detached from the "Independence," and ordered to duty at the Marine Rendezvous, San Francisco, Cal., and to special duty in that city.

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CHICAGO, AUGUST 1, 1891.

No. 5

ORIGINAL ARTICLES.

NECROSIS OF THE MAXILLÆ, WITH A REPORT OF THREE CASES.

*Read in the Section of Surgery and Anatomy, at the Forty-second
Annual Meeting of the American Medical Association,
Washington, D. C., May 5, 1891.*

BY WALTER B. JOHNSON, M.D.,

OF PATERSON, N. J.

SURGEON TO THE PATERSON EYE AND EAR OFFICINE, SURGEON
TO THE PATERSON GENERAL HOSPITAL, ETC.

Necrosis is the death of bone in mass with subsequent separation of the part, being analagous to gangrene of the soft tissues and differing absolutely in its physiology from caries, which is a molecular death of bone resembling the ulcerative process.

Necrosis occurs with considerable frequency in the maxillary bones, having a decided preference for the inferior maxilla, which it affects in about 65 per cent. of the cases; its selection of the lower jaw as a seat of infection is probably due to the comparatively limited vascularity and the absence of periosteal reduplication in this bone, and to its position being unfavorable to proper drainage.

The causes of necrosis of the maxillæ are osteitis, periostitis or periodontitis resulting from one or more of the conditions or diseases here enumerated.

By extension.	{ Dental ulceration. Alveolar inflammation. Alveo-dental inflammation.
By irritation.	{ First or second dentition. Eruption of wisdom teeth. Syphilis.
By disease	{ Exanthema. Scrofula.
By poisons.	{ Mercurials, systemic. Phosphorus, local. Arsenic, local. Chloride of zinc, local.
By traumatism.	{ Teeth extraction. Blows or falls.
By idiopathia.	

In maxillary necrosis from any cause the infection and the course of the disease are very similar, varying only in the location of origin and in the extent of the destructive action.

The inflammation may occur primarily in the osseous structure itself causing an excessive

engorgement with rapidly increasing stasis in the blood vessels, resulting, if not speedily relieved by antiphlogistic local and constitutional treatment, in a complete cessation of the nutrient faculty with immediate death of the entire portion of bone affected, and subsequent separation from its periosteum and exit through the soft parts.

This inflammation of the osseous body itself occurs more frequently as a result of the process of dentition. When occurring from this cause the effect is more prolonged in consequence of the continued irritability and excitability of the parts concomitant to this process.

If the inflammation originates in the periosteum or periodontum the resulting necrosis is apt to be less rapid or extensive, and occurs from the separation of the periosteum or periodontum from the osseous structure by a plastic hypertrophic exudation of osteophytes causing death of the bone from malnutrition, and accounts for the wonderfully perfect reproduction that is happily of so frequent occurrence after this disease. The periosteum is frequently destroyed in part during the progress of the disease, as also are the deciduous teeth and the permanent teeth germs, although disease may completely encircle a permanent tooth in its alveolar crypt without passing through its vascular sac or in any way affecting its formative tissue or interfering with the process of calcification, in which case the tooth may go on to a stage of complete development and be erupted, in the newly formed osseous tissue, at its natural point or at some point along the jaw which may have been designed for a tooth which was destroyed by the disease. The necrotic process is marked by four distinct periods.

1. The hyperæmic or stage of inflammatory engorgement.
2. The hypertrophic or stage of cacoplastic exudate, with formation of fetid pus.
3. The separative or stage of demarkation of bone with loosening and exfoliation of teeth.
4. The formative or stage of exit and reproduction.

The treatment should always be applied in strict accordance with the existing stage of the disease.

1. Active antiphlogistic internal medication and external application, blood letting, prompt

removal of any exciting cause or source of local irritation.

2. Early incision, antiseptic syringing, assistance in commencing separation of periosteum.

3. Antisepsis, constant syringing, tonics, removal of bone through the mouth in pieces or in mass without injury to the periosteal cradle, when exfoliation has occurred and it can be completely and readily separated from the periosteum and soft parts. To remove the body of the lower jaw, division at the symphysis is imperative.

4. Antiseptics, cleanliness, stimulating injections, continued tonic treatment and nourishment, while the discharge persists; Nature does the rest.

The prognosis is good as regards the question of ultimate recovery, although in patients of a scrofulous or syphilitic habit and in poor tissue builders the progress of the disease is slow, (from seven months to two years) and the destruction of tissue is often so extensive that a greater or less amount of permanent deformity results.

The usefulness, strength and natural motion of the jaw is generally maintained either by the formation of new bone if the periosteum is healthy, or in case material destruction of the periosteum has occurred by the formation of a fibroid cicatricial tissue of unusual strength supplying its place.

Case 1.—W. B., age 4, United States. Male. His family history is good on the paternal and maternal side; no history of disease of bone can be traced. For a little over a year before coming under observation he had trouble on the right side of his face. He had at first a swelling over the superior maxillary bone which assumed a bluish color, was attended by severe pain and a decided febrile movement coming on suddenly, and under hot paluvia and general antiphlogistic treatment almost entirely disappearing, only to reappear in the course of a few days or weeks.

Three months after the onset of the disease an external incision was made just under the lower eyelid and a considerable quantity of pus was discharged; the fistula thus formed continued to discharge up to the time of his first visit.

On examination found some tumefaction of the cheek and a permanent spot of ulceration just under the eyelid about over the orbital ridge, causing a marked ectropion as a result of cicatrization and adhesion, passing a probe through this opening dead bone was instantly discovered about the infra-orbital edge of the superior maxillary bone, extending downward towards the teeth and backwards towards the orbital plate of this bone.

An operation was advised and performed as follows: the patient being etherized, an incision was made in the mouth extending from the first bicuspid tooth backwards one inch and upwards towards the fistulous opening about three quar-

ters of an inch; a probe threaded with a seton of braided horse hair several strands thick was then passed into the incision and through the fistulous opening. This seton was fastened securely in position; one end passing from the mouth and the other from the opening, being retained for one week; after this time it was removed, the internal opening became permanent and the external closed in a few weeks.

The opening within the mouth was increased in size by the manipulation used in separating the periosteum from the bone and in removing plaques of bone from time to time until all of the external alveolar plates of that side had come away.

About three months after the first examination, and fifteen months after the onset of the disease, a smooth prominence was detected by the probe high up and apparently just under the orbit. It was removed with difficulty; although not firmly fixed it had the size and shape of the crown and body of a second molar permanent tooth. It was devoid of roots and seemed to be in process of formation. It was very light and semi-transparent, having a very sharp edge, and within this edge and adherent to the tooth formative pulp; a large piece of dead bone was also removed at this time which formed the external wall of the antrum of Highmore, causing a profuse hæmorrhage, some of which was discharged through the nose; hæmorrhage from the nose occurred quite frequently during the progress of the treatment, subsequent to this time, as a result of passing the probe in search of dead bone. Inflammatory attacks had occurred on different occasions up to this last procedure and had been accompanied by profuse discharge of pus from the internal opening and on several occasions from the external opening also, but from that time on no more bone was removed and the sinuses were allowed to heal.

Eight years later, at the present time, the patient is strong and well nourished, has had good health and no trouble with his teeth, has a depression along the entire right side of the upper jaw due to loss of the alveolar plates. The lateral, eye, first bicuspid, and first molar permanent teeth are perfect and in good position, the second bicuspid is in position but entirely reversed, so that the external and internal surfaces of the tooth look from before backward. The second molar is absent. The cheek is adherent to the maxilla held by several cicatricial bands at the point of opening of the old internal sinuses. There is a slight scar under the eye and an almost imperceptible drooping of the lower lid, the cicatrices which caused the ectropion having been absorbed. The patient's present appearance would hardly suggest the possibility of so tedious and extensive a disease ever having existed.

D. M., a female, age 5, United States. Her

family on the father's side has been noted for longevity and strength and give no history of any infectious or hereditary disease. The mother is of an extremely nervous and excitable temperament, and on her side relates a history of pulmonary trouble, but not within her immediate family. There has been no history of bone disease on either side. The patient had always been healthy and was fat and robust, never having had any illness of importance until the onset of the present trouble, nine months previous to her coming under observation. When four years and three months old a swelling of the left side appeared and was accompanied by occasional attacks of pain. This swelling and pain was considered a result of ordinary toothache and was very much neglected.

Three months from the time of its inception, the tumefaction and pain having persisted and increased, an opening occurred on the inner side of the cheek near the angle of the lower jaw, through which considerable quantities of stringy pus was discharged. The opening and discharge had occurred after great febrile disturbance, swelling and pain; from this time until nine months after the disease first appeared, the history is a simple repetition of exacerbation of the swelling and return of a subsiding discharge through openings permanently established or through new openings occurring, and always being accompanied by febrile disturbance and pain. First examined patient nine months after the onset of the disease. At that time there was great tumefaction of the face on the left side with external and internal points of opening or cicatrization.

The swelling was extremely hard and unyielding to pressure at any point, extending over the entire left side of the face and neck, and was not painful except when an attack of inflammation was coming on and pus was forming.

The child was unmanageable, and ether was administered in order that a proper examination could be made; on the outer side of the lower jaw and in front of its angle several fistulous openings were discovered, into which a probe was passed disclosing some points of roughened bone. There were several external openings which communicated directly with the roughened bone itself, or opened into other sinuses within the path.

Two weeks after the above described examination, which resulted in a decided increase in the swelling, redness and swelling of the parts, and an attack of cervical adenitis, she was advised to submit to an effort at removal of the dead bone, which was detected at the first examination. She was placed under ether and an incision about an inch in length was made extending from the angle of the jaw forward. Large quantities of fetid pus and a plate of bone the size of

a five cent piece were removed. This opening was made permanent by syringing, manipulation and applications, and during the three months following, there were removed from eight to twelve small plates of bone varying in size from a split pea to the little finger nail, and, also, two of the permanent teeth in process of formation; one had attached to it the formative pulp and was apparently healthy, the other had arrived at the stage of crown formation, was greenish and discolored and had the appearance of having been the original cause of the trouble and having probably acted as a foreign body for months.

The disease, after this operation, practically abated, although it was some weeks before the sinuses all closed, and the treatment was continued until that time.

Present appearance, eight years after the cessation of the trouble, patient strong and well nourished, has five scars about the angle of the jaw on the cheek, and a decided sinking and loss of tissue at the angle of the jaw and extending forward to the bicuspid teeth. The two molar teeth are gone, having been lost during the progress of the disease. The second bicuspid tooth came in, but decayed very shortly after and its removal was rendered necessary as it was also ulcerated; it had, however, ample root formation. The mucous membrane of the cheek is drawn towards the opening made at the operation by cicatricial bands, adherent to the reproduced portion of the jaw bone, which has changed its shape slightly at the angle in consequence of there being no teeth to oppose the upper molars.

The patient is rather a prepossessing child and is but slightly deformed as a result of her necrosis.

H. D., male, age 6, United States. Has a syphilitic history on the paternal side, which disease, as far as can be ascertained, was never contracted by the mother. Has no family history of diseased bone. Was in the enjoyment of excellent health, and had suffered from none of the diseases of childhood; at five years of age he had a moderate swelling of the face and toothache, so-called. The pain in the face and swelling increased to such an extent that in three days the parents were compelled to consult a dentist, who extracted the tooth supposed to be the cause of the trouble; the tooth drawn was only slightly decayed.

The drawing of the tooth was immediately followed by so rapid an increase in the swelling that on the second day thereafter the patient was unable to open his mouth.

Two months after this time, the child meanwhile having been very ill and suffering great constitutional depression, an operation for the removal of dead bone was performed, and five small scales varying in size were removed; all of these scales were very thin and rather longer than they were broad.

First saw patient one year and two months after the onset of the disease; there were several internal and external scars and openings where previous incisions had been made. The face was swollen and hard, but the inflammation was not and had not been very severe for a few weeks, the discharge of fetid pus was very great, an abundance of dead and roughened bone could be readily detected and it was easily movable when traction was made upon it with a bent probe.

Immediate operation was advised, the patient was etherized and a long incision made extending from the angle of the jaw nearly to the median line; the left half of the inferior maxillary bone was removed in two large pieces; a number of spiculæ of bone of different sizes also came away during the operation. The largest piece represented the body of the jaw and had connected with it two teeth not completely formed, slightly discolored, dead and not in process of formation, as there was no pulp adherent to them. The other piece consisted of the angle of the jaw, the condyle and coronoid process, and required for its removal sharp traction on the dental forceps, although it was undoubtedly separated from its periosteal cradle. After the removal of the bone mentioned the parts were thoroughly cleansed until no particle of dead bone could be felt at any point.

The child passed from my care after the operation but never had any subsequent attacks of inflammation and no dead bone was discharged or removed after that time, although the purulent discharge continued in decreasing amount for nearly a year. The long continuance of the discharge after all dead bone had certainly been entirely removed, is ascribed to the fact that proper antiseptic treatment was not continued, the parents being unable to persuade the child to undergo any further manipulation or application after the operation.

I have with difficulty been able to induce him to present himself for inspection at this time, over seven years after the trouble has passed away.

He is 13 years old, male. His general health is good, and has been so since the discharge stopped six years ago. During this time two teeth were erupted in addition to those at present in the jaw; one was on correct line but was partly decayed, the other was out of line and grew towards the cheek; the removal of this tooth was not painful but the line tooth was more firmly fixed and caused some pain on its removal. While these teeth remained in position they were a source of irritation, and also had a slight but constant purulent discharge from around their roots; after these teeth were removed, there was a great decrease in the tumefaction of the side of the face.

Inspection discloses a large scar on the neck,

the result of a cervical adenitis which had occurred in the early stages of the disease. The angle of the jaw is depressed and the side of the face is very much sunken at that point and in front of it nearly up to the median line. The lower jaw as reproduced is much shorter from before backwards than it was formerly, the central teeth striking about three-quarters of an inch behind the natural line, as shown by the position of the teeth of the upper jaw.

He has one bicuspid and an eye tooth on the diseased side, and also the central and lateral, which are in correct position; the eye tooth is misplaced, growing forward with most of its root exposed, and is partially decayed, and should be drawn. The bicuspid is in line and in position and seems to be a perfect tooth.

The jaw bone has made a complete reproduction but is composed on the diseased side of a comparatively small amount of osseous tissue; it is very useful, and strong enough for any of its ordinary uses.

The resulting deformity is much greater in this case than in either of the others, the sinking of the cheek and shortening of the maxilla giving the features a peculiar cast.

The study of the cases here reported and the history of other cases considered, indicate that incision and appropriate treatment in the early stages of the disease have a decided tendency to lessen its extent, while early efforts at removal of dead bone before separation has occurred are apt to increase the extent of the disease and resulting deformity, and may lead to a fatal termination.

CADAVER STUDIES ON THE REMOVAL OF THE SEMILUNAR GANGLION THROUGH THE FLOOR OF THE SKULL.

Read in the Section of Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY EDMUND ANDREWS, M.D., LL.D.,

PROFESSOR OF CLINICAL SURGERY IN CHICAGO MEDICAL COLLEGE.

The horrible severity of pain in certain trifacial neuralgias is such as to drive the patient to the verge of suicide. Most of them are relieved for a period of one or two years by operations already well known, and a few are cured for life, but the majority relapse, because the neuritis has progressed to the semilunar ganglion, and hence nerve sections and stretchings below that organ relieve only temporarily. I have formerly shown that this relief can be repeated at least several times, by reopening the wound and pulling upon the cicatrix to which the stump of the nerve is attached, thus subjecting the stump and the ganglion itself to repeated stretchings, but I have

the faith that the cure can be indefinitely repeated by this process.

I long ago concluded that the disease, in most cases, commences as a progressive neuritis excited by a decayed tooth, and extends upward into the ganglion itself, and hence that nothing less than the removal of the ganglion will effect a cure in the most obstinate cases. About a year ago, I commenced cadaver studies to see if I could devise any safe operation for the removal of the offending organ. It appeared six months later at Prof. Wm. Rose, of King's College Hospital, London, was independently considering the same question, and since that time he has performed the operation twice on the living subject, with success, thus fairly earning the credit of priority in point of time.

My experiments upon the cadaver, however, have interested me greatly, and throw much light upon the best routes and methods of procedure. They also show that about six principal variations are possible in the plan of the operation. Cadaver studies are specially important, in this operation, because we cannot test and perfect the technique upon the inferior animals, since there is no species having a cranial anatomy near enough to that of man to answer the purpose.

The fifth, or trifacial nerve, emerges from the base of the pons Varolii as a rather large flat, ribbon-like band, and runs forward over the crest of the petrous portion of the temporal bone near its apex, where it enters an opening in the dura mater. This tough membrane, on the anterior surface of the petrous portion of the bone, divides into two layers, and contains the ganglion between them, so that the latter is, as it were, ensheathed in a flattened cavity of the dura mater about the size and shape of a small Lima bean. The under side of the ganglion lifts easily from the floor of the capsule, having a bursa under it, an arrangement which facilitates separating it from the underlying carotid artery, but the upper surface is very firmly adherent to the roof of the capsule, so that even a curette can scarcely disengage it. This arrangement adds greatly to the difficulty of the removal of the ganglion.

Out of this capsule the three branches of the nerve run, and the largest one, the inferior maxillary, passes downward and outward through the foramen ovale, and becomes the guide of the surgeon to the capsule of the ganglion. It is sheathed with a stout prolongation of the dura mater, which withstands pretty strong traction without rupture.

Besides several small twigs, the inferior maxillary divides into two main trunks, the dental and gustatory.

The semilunar ganglion, or rather the under side of its capsule, lies in part directly upon the internal carotid artery where that vessel emerges suddenly from the petrous portion of the tempo-

ral bone, and its inner border is in close relation with the curve of the artery, where it enters the cranium, and also with the cavernous sinus, so that care must be exercised not to wound these vessels.

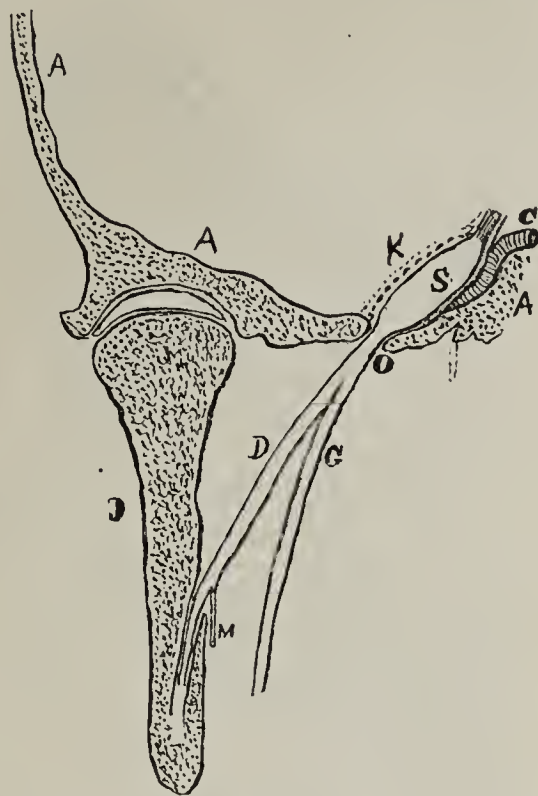


Diagram of part of the relations of the semilunar ganglion.

- A A A.—Portion of skull.
- J.—Condyle and ramus of jaw.
- S.—Semilunar ganglion seen edgewise.
- C.—Internal carotid artery.
- K.—The double dotted line represents that layer of the dura mater constituting the roof of the capsule of the ganglion. The white line between the ganglion and the artery is the under layer or floor of the capsule.
- O.—Foramen ovale at exit of inferior maxillary nerve.
- D.—Dental branch.
- G.—Gustatory branch.
- M.—Myloid branch.

This cut is a diagram only, to show certain relations, and not a precise section.

The ganglion is therefore in a very inaccessible location, being inside the skull, near the centre of the cranial floor, and in dangerous relations with great vessels—facts which have heretofore ruled it out of the field of operative surgery.

A closer study of the parts shows, however, that boldness and skill can storm the citadel. The point of approach must be at or near the foramen ovale, but in order to operate in such a location we must, by certain preliminary steps, uncover the parts, so as to see them with the eye, touch them with the finger, and attack them by a precise and unerring use of our instruments.

Fortunately, there are infallible landmarks to guide us to the foramen ovale, as a study of the topography will show.

My studies on the cadaver show the possibility of six forms of operation:

1. Prof. Rose's first operation, which was done by him six months ago. He uncovered the foramen ovale by excising the whole of one superior maxilla, thus getting at the parts from the front. He inserted the centre pin of a small trephine

into the foramen, and took out a button of bone surrounding it, and contrived, through the opening thus made, to extract more or less completely the ganglion.



The base of the skull seen from beneath.
O.—Foramen ovale.
S.—Foramen spinosum, for middle meningeal artery.
P.—Pterygoid ridge.
T.—Place of applying trephine in operation No. 3.

The patient's eye seems to have suffered some injury, for it became inflamed after the operation, and had to be enucleated, but the neuralgia ceased, and at the latest advices had not returned.

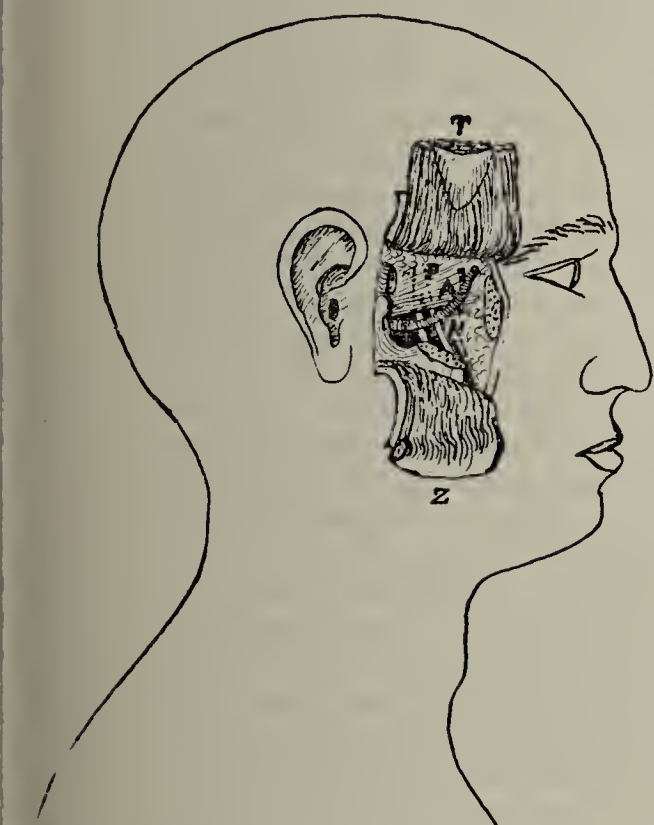
2. Rose's second operation was done last January. The method of uncovering the field of operation is very ingenious. Instead of removing the superior maxilla, two perpendicular incisions are made, one a little in front of the ear, and the other at the anterior extremity of the zygomatic arch, the posterior one commencing at the height of 2 inches above the zygomatic arch, and extending as low as can be done without severing the duct of Stenon, or more properly of Stenson. The anterior incision commences at the same height and extends a little lower than the poste-

rior one. A horizontal incision extends also the zygomatic arch, connecting the other two. The zygomatic arch is now sawn off at each extremity, and turned down, carrying the attachment of the masseter muscle with it. This uncovers the coronoid process of the lower jaw, which is sawn at its base, and turned up upon the temple with the temporal muscle attached.

This uncovers the deeper parts, which are carpeted with a loose connective tissue containing in most instances, the internal maxillary artery with many smaller vessels; yet in some cases that artery takes a deeper course, running internal to the external pterygoid muscle. The connective tissue being drawn aside or snipped away and the artery or arteries ligated, if necessary, the short and thick external pterygoid muscle will be seen, running horizontally from the external pterygoid plate backward to the neck of the jaw. Usually the internal maxillary artery comes out from the inner side of the neck of the jaw at the lower border of this muscle, and winds forward and upward around its external border. Carefully clearing away the connective tissue below the muscle, the large inferior dental nerve will be found, running down from the inner side of the muscle to the inferior dental foramen in the centre of the ramus of the jaw, and a little in front of it, the equally large gustatory branch on its way to the tongue. These unite higher up into one trunk, which can be traced with a little patience, up to the foramen ovale about $1\frac{1}{2}$ centimetres forward and inward from the inner border of the condyle of the jaw. In feeling for the sharp edge of the external pterygoid plate, and tracing it up to its junction with the base of the skull, it will be found to lead exactly to the anterior extremity of the foramen ovale, so that we have two guides to the orifice of the great nerve, and the sharp edge of the external pterygoid plate. If the external pterygoid muscle is thick and voluminous, it may become necessary to divide it near the neck and retract it with a suitable instrument, so as to uncover the foramen. The axis of the foramen has such a direction that a line drawn from the centre of the coronoid process upward and inward through the centre of the foramen, passes just beyond it into the centre of the ganglion itself.

The trephine is now applied, but owing to its position being oblique to the floor of the skull, the crown of the ordinary instrument strikes the bone, without the centre-pin being able to reach the foramen, and consequently the saw cannot be steadily worked. To overcome this, the centre-pin must be capable of being protruded 2 centimetres, and have the end round and blunt, instead of sharp, and be withdrawn as the saw progresses, so as to run no risk of entering the skull too far, which would endanger the carotid artery. The centre-pin is also made about on

If the diameter of ordinary centre-pins, otherwise it will be sometimes too large to enter the foramen. As the crown of the saw advances, the button is drawn back. Prof. Rose uses a trephine of 1 inch inside diameter, like the specimen here shown. If this is done, it must not be advanced too far, otherwise the inner side of the crown will come directly upon the carotid artery, before it enters the cavity of the skull. When the inner side of the trephine has cut a little way in, remove the button, and clear away needed portions of bone with other instruments.



View of relations of the nerves.

- Zygomatic arch and masseter muscle turned downward.
- Temporal muscle and coronoid process turned upward.
- External pterygoid muscle.
- Inf. dental and gustatory nerves. Their continuation up behind the pterygoid is intimated by dotted lines. The emergence of the common trunk from the foramen ovale is at the left of and covered by the muscle.
- Internal maxillary artery.

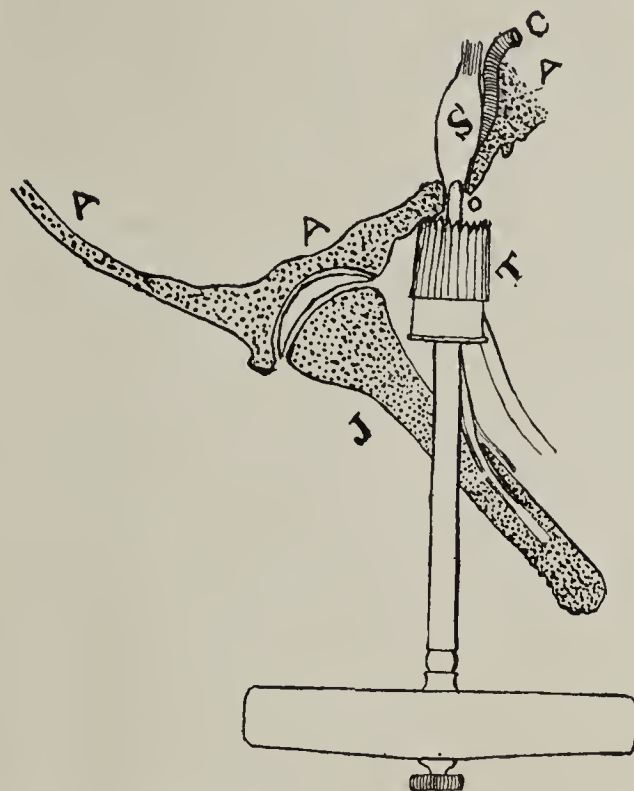
The extra length of shaft is to enable the hand to clear more easily the face and jaw, but still ordinary length can be used.

The ganglion is in the bottom of the hole left by the instrument, and can be removed by curette and by a small hook-shaped bistoury described by Prof. Rose, assisted by a blunt hook. The carotid artery lies in contact with the semilunar ganglion on the face that looks downward, backward and inward—corresponding to the anterior slope of the petrous portion of the temporal bone. The vessel also curves around the upper and inner border of the ganglion directly in line with the axis of the foramen ovale, so that instruments must not be pushed too far in that direction, for if advanced too deeply, the crown of the trephine will cut the artery.

From careful dissection, and experimentation upon the cadaver, I am convinced that the

following plan is better than either of the others:

Reflect the masseter and temporal muscles as before. Expose the external pterygoid muscle, divide it near the condyle, and draw it out of the way with a suitable retractor. You now have a considerable area on the base of the skull, where there is no important organ to be wounded. This is a smooth triangle, having the pterygoid ridge of the temporal bone as its base, and its apex a little beyond and including the foramen ovale. One head of the external pterygoid muscle arises from this clear area, which should be dissected up and retracted, or snipped out. This will give



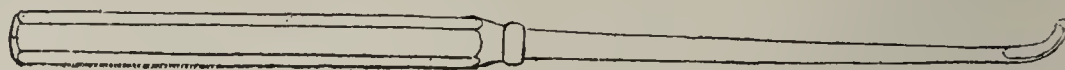
- A. A. A.—The skull.
- S.—The semilunar ganglion.
- O.—The foramen ovale.
- J.—The ramus of the jaw.
- T.—The trephine with the blunt center pin in the foramen.
- C.—The carotid artery.

you a third guide to the foramen ovale, for if you clear away the tissues from the bone in a direction forward and inward from the inner border of the condyle, you will come unerringly, at the distance of about $1\frac{1}{2}$ centimetre, to the outer side of the foramen, which is an opening about $\frac{3}{4}$ of a centimetre in length, so that it need not be missed, even if the nerve had been torn or cut away by any accident. This clear space is over 2 centimetres in diameter, and affords abundant room for a 2 centimetre trephine, as shown at T, Fig. 2. Backward and outward from the posterior end of the foramen ovale, and at the distance of about $\frac{1}{2}$ centimetre, the middle meningeal artery enters the skull through the foramen spinosum, so that, if meningeal hæmorrhage occurs in the use of the trephine, it can be stopped by pressure of the tip of the finger at this point, or by ligature, or by plugging the foramen spinosum.

Also when the button of bone is withdrawn, the artery can be seized through the trephine

hole, since it lies on the external surface of the dura mater.

pterygoid ridge, and remove a large button of bone. Then raise the dura mater from the floor



Curved and blunt pointed bistoury, modified from that of Rose.

Now apply a medium-sized trephine at the point marked with a black circle in Fig. 2, and carefully remove the included bone, setting the inner edge of the saw within 3 or 4 millimetres of the outer edge of the foramen ovale. Next take a narrow guage forceps and nip away first the isthmus of bone between the trephine hole and the foramen, and then, drawing the nerve outward into the trephine hole, nip away the inner border of the foramen. By a good artificial or natural light, you now see well exposed a pretty large ovate area of dura mater, with the large inferior maxillary nerve emerging from its further portion. The sheath of the nerve here is very strong, so that it can be freely pulled during the further manipulations. Now peel up the dura mater from the floor of the skull under the ganglion, going a few millimetres beyond the locality of the foramen ovale. This lifts the ganglion with the membrane, it being included between the two layers. Next seize the nerve, or the stump of it, near the opening, with narrow forceps, and draw it outward. Dissect off the dura mater from its posterior or further surface of the insertion of the nerve, and you will come into the capsule and the bursa between the gland and the floor of the capsule. Extend the opening of the capsule to the right and left somewhat freely, and with a careful use of Rose's knife or a very small blunt-pointed and curved bistoury, divide the origin of the superior maxillary nerve, and if possible of the ophthalmic branch. The latter lies very close to the cavernous sinus.

Now have an assistant lift the dura mater, while another one draws the nerve inward, and you will be able to open the dura mater and very slowly to dissect the ganglion away from its firm adhesions to the roof of the capsule. This dissection is a little tedious, on account of the firmness of the adhesion, but patience will accomplish it, and if one or more slight cuts occur through this upper layer of the capsule of the dura mater, no dangerous results will follow. Indeed, it might perhaps be well to take curved scissors, and cut out a small circle of the roof of the capsule and take it away with the ganglion, thus shortening the operation. This operation admits of splendid illumination, and enables one to see clearly the steps of the dissection.

4. A fourth method is possible on the cadaver, but less easy than the third. It is to commence as in the previous operation, but to set the centre-pin about a centimetre farther out on the

of the skull, working inward until the ganglion is lifted and the finger feels a large probe insert into the foramen ovale. Now open the capsule and patiently work out the ganglion, guided by feeling rather than by sight.

5. A fifth plan can be carried out as follows. Leave the zygoma and the coronoid process untouched. Raise a semicircular flap of scalp and temporal muscle from the temporal fossa in such a way that a large trephine can be set on the bone, with its lower edge close down to the zygoma, much as in Stephen Smith's operation for tying the middle meningeal artery inside the skull. Remove the button and, making a flap in the dura mater, insinuate a peculiarly shaped curved spatula under the convolutions of the brain, and lift them from the floor of the middle fossa. The ganglion lies on the anterior slope of the petrous portion of the temporal bone, with its lower edge about $2\frac{1}{2}$ centimetres from the lower edge of the trephine hole. Pass in the finger under the arch of the spatula, run it along the petrous portion to identify the locality of the ganglion by its softness. Withdraw the finger, throw in a strong light, dissect out a circle of the roof of the capsule of the ganglion, and use the hooked shaped bistoury, bent scissors and curette to sever other attachments.

This plan temporarily compresses the brain, and makes some unavoidable contusions and slight wounds of the convolutions, but it is not very difficult. It would be doubtless more dangerous than either of the others, and therefore is not to be preferred in our present state of knowledge.

6. The sixth and last method is to make an incision from the anterior edge of the temporal muscle down to the anterior slope of the coronoid process, and saw off the anterior end of the zygoma. Next saw off the posterior end through a small opening in the skin. Then saw off the ramus of the jaw from the middle of the anterior slope of the coronoid downward and backward near the angle of the jaw. Raise this flap of skin, muscle and bone as on a hinge, and turn it back over the ear. My first hope was to uncover the deeper parts in this way without sacrificing any bone, but the result was to pry the condyle of the jaw inward, bulging the external pterygoid before it, and effectually covering the foramen ovale from sight; hence, if this plan is adopted, it is necessary to excise the condyle, draw away the external pterygoid, and divide part of the internal pterygoid, in order to follow the inferior maxillary

lary nerve into the foramen. This and the plane surface of bone external to it being thus exposed, the operation is finished either as in No. 2 or in No. 3. The loss of the condyle is an objection in this case, just as the loss of the superior maxilla is in No. 1. On the whole No. 6, though mechanically feasible, cannot be recommended.

Of the whole six, I give the preference to the third, which uncovers the parts as in Rose's second operation, but applies the trephine at a different spot.

In the two cases operated on by Prof. Rose, the first lost the eye by inflammation following the operation, due perhaps to accidental injury at the resection. In the second case the professor informs me that the eye, three months after the operation, was in good condition, and was recovering its lost reflexes. Both patients were relieved of their pain, thus far, but more time must elapse to demonstrate the permanency of the cure.

As the eye is deprived of sensation, the patient must be taught to care for it and protect it. In the same way one side of the tongue being benumbed, it must be guarded from being wounded by the teeth.

A neurotomy of the fifth nerve on the proximal side of the ganglion can be performed, without removing the latter. If you proceed as in operation No. 3 till the button of bone is removed, and then open a flap in the dura mater external to the ganglion, the convolutions can be lifted, and a knife with a double curve and blunt point can be passed over the crest of the petrous portion of the temporal bone, and made to cut the nerve where it enters the capsule of the ganglion. This operation is possible, but does not seem advisable. It is not best to replace the button of bone in these cases, because a certain portion of such pieces necrose, and the deep location renders the subsequent extraction of the dead fragment difficult.

On the whole, the removal of the semilunar ganglion is a slow and rather complicated operation, but it is not very dangerous. It is to be employed without hesitation whenever a trifacial neuralgia is so severe and so incurable that the patient has no reasonable hope of relief from extreme pain by other measures.

Time only can show how many will be permanently cured. From the nature of the case we should expect that the cured cases would be a large majority, but that in a few the brain itself may be the seat of disease, and baffle our efforts. If the brain is the seat of the trouble, we can usually determine it by the coincident presence of other cerebral symptoms, and thus avoid operating upon hopeless cases.

In making these researches upon cadavers, I am indebted to Profs. Wyllys and Frank Andrews for valuable assistance.

No. 6 Sixteenth St., Chicago.

PERITONITIS, FROM A SURGICAL STANDPOINT.

Read before the Section of Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY M. PRICE, M.D.,
OF PHILADELPHIA, PA.

There is no more important subject presented for our careful consideration, or more deserving our most earnest thought, than peritonitis.

It is practically a new field for investigation; few of us comprehend its magnitude, or the importance of the work now being done. Idiopathic peritonitis is a myth and a delusion. The error has been that symptoms have been mistaken for the disease, and when relieved, a cure is accredited to some special form of treatment. Vomiting and tympanitis with pain does not necessarily indicate peritonitis.

There are many conditions of the digestive tract that will give all these symptoms, yet no peritonitis be present. And you may have peritonitis without pain, without tympanites, in fact, almost devoid of symptoms, yet have many ounces of purulent fluid in the peritoneum.

Peritonitis always has a cause, and if the case be properly investigated, we can find it. For so serious a condition, it is one of the most curable diseases we are called to treat. That is, if we investigate the cause, and remove it. And then again, it is most wonderfully submissive to bad treatment. Improving again and again under the opium treatment, which is the worst of all, for it blinds the practitioner to the dangerous forms when they do appear for proper treatment, and where nothing but the proper treatment will save life. I marvel at the great credit men give to the opium treatment of peritonitis. And when recovery takes place, credit all to their treatment, with not one thought of the wonderful protective power of nature to guard her inner work.

Have they treated the condition, the actual disease, the exciting cause? No, in most cases they have not even investigated to find the cause; but have contented themselves with the thought that their patient is now all right, notwithstanding the fact that the patient suffers repeated attacks, until there comes a time when the operating table or the post-mortem table reveals to the wondering practitioner a cause. Thanks to the surgeon, we do not have to resort to the post-mortem to find what has given our patient peritonitis, or the way for their relief. I purposely avoid quotations from standard works; all of you are familiar with them, and as most they say does not interest us at the present day, I will not trouble you with either their pathology or their so-called treatment, with opium as their sheet anchor. I except those writers of a century ago: Dewees, and that great teacher and writer, George B. Wood. How strange that medical men are so

forgetful of the teachings of these masters of their day ! Men follow the fashions of their professors.

Peritonitis is a disease so peculiarly surgical in the development of its pathology, and the perfection of its treatment, and the utter extermination of its mythical origin, that we do not any longer have to resort to the dead-house for our knowledge of its history. Ante-mortem examinations have taken the place of the dead-house pathology of only a few years ago. We all remember to have made such examinations that, to-day, by operative measures, the patient could have been saved. Its cause removed, and thereby forever preventing the return from the same point of infection. For some of these cases passing through my hands have had as many as five different attacks, and had it not been for surgical aid they could not have been saved.

The peritoneum in health is a lymph sac enclosing every organ in the abdominal cavity. There are a few exceptions to this rule, but of slight moment in the consideration of the subject of the inflamed condition. A peritonitis may be partial, or it may include the entire membrane ; a general peritonitis. The symptoms are mild or severe, partial or general, owing to the nature of the irritating cause. It will, in most cases, begin with a chill, but not always. It usually has at the beginning a high temperature, but not invariably. Pain on pressure is one of the best, and by all odds the most valuable symptom we have to guide us to a correct diagnosis. Yet, the pain may be so slight that the patient may not call our attention to its existence. The pulse may be quick from the start, and, after a short period, become hard and tense.

There is no single symptom that can be depended upon, many patients when operated upon having a pulse as high as one hundred and fifty, and they made just as rapid recovery as those whose pulses were at eighty, full and strong. In most cases, however, the pulse is thin and thready. Tympanitis is not a constant symptom, though one that gives a great deal of trouble, and adds wonderfully to the risk of the patient.

The expression of the face, next to pain, is probably one of our best diagnostic symptoms ; it is one of great anxiety and alarm expressed in every feature ; they seem to have aged many years in a single day. The features seem pinched and prematurely old. The bowels are always constipated, unless we have a case of peritonitis resulting from dysenteric ulceration, or from some complication of the intestinal tract. The old treatment of putting the bowels in splints by opium was certainly unnecessary, as it had already been done most effectually by the paralyzing influence of the inflammatory condition.

Then, to properly understand the condition of

our patient, we must investigate every organ in the abdominal cavity ; the pelvis through the bowel, if it be a man, and through the vagina, if a woman. We can thus derive great help and often a perfectly clear understanding of the condition, when we can get it in no other way.

In almost all the cases to which we are called to remove the source of infection, the effort of nature to limit its destructive ravages are well marked by protective lymph walling in the diseased portion. In the many examinations we have made on the operating table of peritonitis, the conclusions that have been forced upon us by such investigations prove to my mind that there is always an irritating and demonstrable cause for all cases of peritonitis.

I have never found a case without positive indications of destructive changes going on in the infected parts, the contents bathed in serous sero-purulent fluid, with adhesions varying from slight to those so firm that it was easier to tear the surrounding tissue than the adhesions, with small collections of pus in many different places walled in by the peritoneum in its efforts to prevent general infection. Young and old alike suffer from its ravages. Both sexes do not suffer alike, for the reason that women are by all odds subjected to many times the dangers of this condition by causes peculiar to their sex.

The older writers did not give peritonitis a separate place, but associated it with other lesions within the abdominal cavity, clearly showing they did not endorse the theory of its idiopathic origin. How near do they come to the pathology of the present day ?

I have, in the last five years, operated or assisted with five hundred operations for the cure of peritonitis ; all of them so serious that life without operative treatment could not have been saved. All of them had been treated by medical men of the best standing in the profession, and at least four-fifths by firm believers in the opium treatment. Many of these patients had suffered more than one attack, some of them as many as five before they had come to that point of their disease where some radical measures had to be resorted to to save life and remove the point of infection. Beside this, I have examined some twenty, who were past all surgical aid when I was called to their side, and in every case a well-defined cause was found for all the trouble. There was not a single case examined in all this long series of cases without lesions of such serious nature that they must by their very character have proved fatal at no very distant day. There was not one case of idiopathic peritonitis in the list, though more than one-third of them had been so named by good men. In the month of December I had the good fortune to assist at eleven bad cases of localized and general peritonitis, and operate four times myself, all of which

must have been fatal very soon, some of them having had several attacks.

The advocates of the opium treatment speak of the disappearance of the distention, and softening of the abdomen after a number of days. In our experience if the case be one of true peritonitis, and the symptoms do not improve under saline purgation, and the temperature come down below the pus standard in from three to five days, we at once decide to remove the cause by operative measures, and I have yet to regret the use of the knife in these cases, but I can say I have to regret some of the delays I have been persuaded into by the fears of other counsel in the cases. Prompt purgative treatment in the beginning of peritonitis, by the saline purgation or the mild chloride of mercury, to clear up the case in the very beginning, and then when you have done all this, and there is no improvement you must, in the present light that surgery has thrown on the subject, operate.

Peritonitis from other causes, the indications being the same, show the great tolerance to manipulation and contact with the poisonous pus in which every known form of microbe must have existed by millions, where large flakes of inflammatory lymph had to be removed by scissors, where the adherent bowel was detached from the pus sac, and yet with all these complications and with all the microbes and pus there was not one case of peritonitis following operation in the whole series of over five hundred cases. What were the causes for all these five hundred cases of peritonitis? all had a cause, and the cause was found in every case. To enumerate all the causes that might cause peritonitis would be a most thankless undertaking, for they are innumerable. The vast area and the important glandular organs enclosed in the peritoneum, add their mite to the list, but by all odds the most prolific cause of peritonitis comes from a diseased condition of the uterine appendages; these offer a direct way of entrance to some of the most virulent poisons to which women are exposed. This mode of entrance and the subject to which it relates, and its influence in the formation and production of peritonitis, local and general, has been the subject of many papers, I might say volumes. I need not here mention it more than as a prominent cause.

Second in importance is that of appendicitis. Here is a prolongation of the large intestine, unused, a place for the lodgment of foreign substances and concretions of its own formation, with none of the cleansing and purifying conditions which other portions of the bowels are constantly subjected to in the constant moving of the contents, and the contact of the secretions of the digestive fluids of the different glands, which have by Nature been placed to correct just that condition to which the appendix is exposed,

with no power to remove. From this source come many of the causes of peritonitis.

In the treatment of peritonitis in the past great latitude was allowed, and medical men made the most liberal use of the privilege in the use of opium and its preparations. Some delighting in the extracts, others a mixture with other drugs, all trusting with implicit faith in morphia in large and repeated doses as much as one grain every two hours, others recommending as much as four hundred grains in the twenty-four hours of the pure extract of opium. Others prefer the liquid preparations, they in their turn mix and blend them in a manner and with a faith as to their marvellous curative qualities that some of us are unable to understand. Great weight is laid on the indications for the use of opium; one observer is satisfied when the patient is relieved of his pain, another not content with this condition alone gives opium for its effect, and his measure of guidance is the respirations; when they have been reduced to ten or twelve per minute, he then considers his patient safe. Then when opium does not bring the result so earnestly sought after, they use a combination of calomel and opium; one they say to stop the secretion of bile, and the other to start the bile on its usual way. They report many happy results, many patients saved by this most ingenious blending of the incompatible. The other treatment contemporary with that just alluded to of peritonitis, such as poultices, blisters, turpentine and the warm application, all to my mind indicate what the practitioner expected to be the result—the formation of pus. This is just the treatment he would give to an existing or threatened abscess in any other portion of the body. How long will this state of things last! Can we not offer them some more encouraging method of treatment? I think we can. I hope the day is past when we will follow blindly the teachings of any man or set of men, but will weigh the facts as they are given us, and from them and our own knowledge of the subject, build a new and more comprehensive treatment than that of the past, which I fear is now almost the only treatment for this most destructive disease when not properly treated and by the most energetic and rational methods.

My firm belief is that when called to a case of supposed trouble to make at once earnest search for the cause, and, if found, to remove it at once, is the proper course to pursue. If the cause be not apparent, then clear up the case with saline purgatives, and when not able to do so, then abdominal section. And, as I have said before in this paper, you will never have cause to regret it. Prompt adherence to this rule has been the practice of all those men who have learned their pathology at the operating table instead of the dead-house.

The present way of treating these cases was also the old way used by the majority of the profession. The very first thing is opium in some form to relieve the pain, as they will tell you in most cases without looking for a hernia, or any other cause for the trouble. Pain is the only symptom complained of, so most men are content when the patient is relieved of that.

I have been called to a patient suffering from strangulated hernia, with all the symptoms of peritonitis, and the medical attendant not aware he had anything more than a case of idiopathic peritonitis to deal with. I will venture to say, that if all the medical men in this city could be asked what the first thing they would do for a case of threatened peritonitis, they would say relieve him or her of pain by opium. It is the almost universal rule, notwithstanding the stress laid on the great danger to the patient in such treatment.

There is still another and most important reason for early treatment in these cases. We all know that one of the favorite and accepted theories of the introduction of tubercle bacillus is through the stomach in its deranged and diseased condition from any cause, and in this way into the general circulation to be deposited in that portion least able to resist its ravages. In these cases where we have a subacute inflammatory condition with large deposits of inflammatory matter of low vitality, where the circulation is in a most unsatisfactory condition, where the thermometer indicates a temperature in which these little bodies grow and flourish to a most alarming extent, tissues of low vitality are fastened together. What better culture ground or condition could even a pathologist wish for in which to feed and grow his medical menagerie. Be this true or not, the fact still stands forth that many of these chronic cases die of tuberculosis.

A NEW OPERATION FOR HARELIP.

Read in the Section of Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5, 1891.

BY CHRISTIAN FENGER, M.D.,
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In all forms of harelip (*labium leporinum*, whether single or bilateral, whether partial or total, whether combined with cleft inter-maxillary bone or not), we find not an excess, but rather a defect of labial tissue, mucous membrane, prolabium and skin. The two portions of the upper lip, when brought together, are too small to form a lip of normal shape; it would require the interposition of a triangular piece of lip with apex towards the nose and base toward the border of the lip, to obtain at once a lip of normal shape. The tissue defect is greatest in the skin, less manifest in the mucous membrane and prolabium;

still in the majority of cases of complete harelip, the defects in these tissues also may be considerable.

It would thus seem natural to select a method of operating by which no tissue should be lost. In all the older methods the so-called "freshening" of the surfaces to be united requires the removal of at least a part of the prolabium, in some more, in others less, at the best, as in the method of Nélaton for small harelip, a displacement downward, to form a projection which must either disappear by retraction and atrophy, or be removed, if present in excess, by a secondary operation.

About five years ago I was led to consider this question in a case of double harelip with rather defective lateral portions, in which I operated after the old method and suppuration with consequent non-union took place. At the next attempt at union, the increased defect of tissue made union still more difficult than at the first operation. I therefore concluded to operate in my next case without the removal of any tissue, so as to have at least not lost anything in this respect if suppuration and non-union should make one or more later operations necessary. When I commenced to operate in this way I found it necessary to apply a separate row of sutures to the prolabium before bringing the edges of the skin together, thus closing the wound toward the mouth, and I soon found this to be a protection against infection.

I have since that time never had any reason to abandon this method for any of the older methods.

I. OPERATION FOR UNILATERAL HARELIP.

1. *Incision.*—The incision is made at the border of the skin and prolabium, four to six millimeters or two to three lines deep, care being taken to guard against opening through the mucous membrane into the mouth.

It is necessary to draw the lip down in order to procure sufficient tension for the knife to divide the tissues; this traction causes anæmia of the border of the lip, making the line between the white skin and red prolabium indistinct. It is necessary to be careful to have the incision precisely in this line, because a small margin of prolabial tissue left with skin will, as I have seen in one case, leave a red brim along the line of union, necessitating a secondary operation for cosmetic reasons. (Figure 1.)

The length of the incision downward and outward depends upon the shape of the two portions of the separated lip. It is unnecessary at the beginning of the operation to estimate the length correctly, as the incision can be prolonged later on, after some of the sutures have been applied and tied, according to the requirements of the shape of the lip when united.

2. *Sutures of the Prolabium.*—Interrupted

sutures of fine silk are applied or inserted from the mucous surface so as to place the knot of the suture in the mouth, the first suture close to the top of the triangle as shown in Figure 2. The ends of the sutures are left long and held together with an artery forceps which is left hanging down. The succeeding sutures are applied in a similar manner at a distance of from three to five millimeters from each other in a number corresponding to the extent of the line of prolabium to be united. These prolabial sutures should include the mucous membrane and sub-mucous tissue only, or as little tissue as will suffice to keep the prolabial edges together. There must be no tension whatever at the line of union; if tension exists from shortness of the labial flaps, it must be overcome by the tension sutures, which will be described later.



Figure 1.

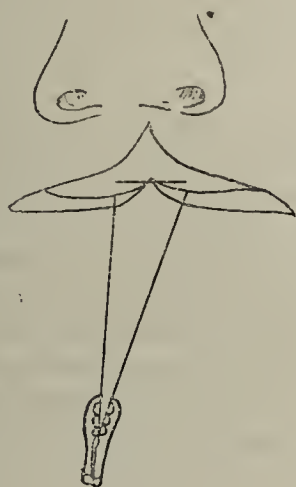


Figure 2.

When apparently a sufficient number of these sutures have been applied, they are tied from above downward, or from the nose to the prolabium, the upper or nasal suture first, the forceps being held up toward the forehead. The united edges must be long enough to give sufficient length to the lip, and permit the lowest point of union to be a little lower down (toward the lower lip), than the sides of the lip and the corners of the mouth. The wound to be united is now closed against the mouth—is made a sub-cutaneous wound.

Sutures of the Skin.—1. Tension Sutures. According to the size of the defect, one or two tension sutures become necessary. I have entirely discarded the figure-of-eight suture with harelip cases, and also the button and shot sutures, and always employ an interrupted suture, using silk a little heavier than that used for the coaptation sutures of the prolabium and skin. In ordinary cases of single harelip one tension suture is sufficient. This suture enters the skin at a distance of one-quarter to half an inch from the cutaneous margin of the wound, and is passed deeply down into the tissue of the lip. Care is taken not to have it pass through to the mouth,

but to have it take in about two-thirds of the tissue of the lip as shown in Figure 4 a. This tension suture should be placed at or near a point where the margins of the wound are the greatest distance from each other—that is, near to the prolabium of the undivided portion of the lip. The tension suture is left with long ends held by artery forceps, and should not be tied until all the cutaneous coaptation sutures have been inserted.



Figure 3.

2. Coaptation Sutures. These sutures (Figure 4, b.b.b.), for which common silk twist (which may be bought in a dry goods store, and disinfected in the usual manner by boiling it from fifteen to thirty minutes in a 5 per cent. solution of carbolic acid) is used, are applied from above downward, or from the nasal angle of the wound to the prolabium, at a distance of three to five millimeters. Three to five sutures are usually required. The lowest suture (Figure 4, c.), is passed through the ununited borders of the prolabium.

The wound is now carefully cleansed by small aseptic sponges, and is finally touched with a sponge wrung out from 2½ per cent. of carbolic acid, or a 1 to 2,000 sublimate solution.

If any hæmorrhage is present it can be stopped by continued pressure with an aseptic sponge for a few minutes; if the hæmorrhage is slight it will cease upon tying the sutures.

The closure of the sutures should begin with the tension suture, so as to prevent the coaptation sutures from tearing through, as they would be liable to do if tied before all tension was done away with.

If in drawing the sutures together it is found that the middle of the lip does not come down low enough, or that there is still an indentation in the prolabium at the line of incision, it is advisable to prolong the cutaneo-prolabial incision a little on one or both sides, as the shape of the lip may require, and then apply an additional cutaneous coaptation suture.

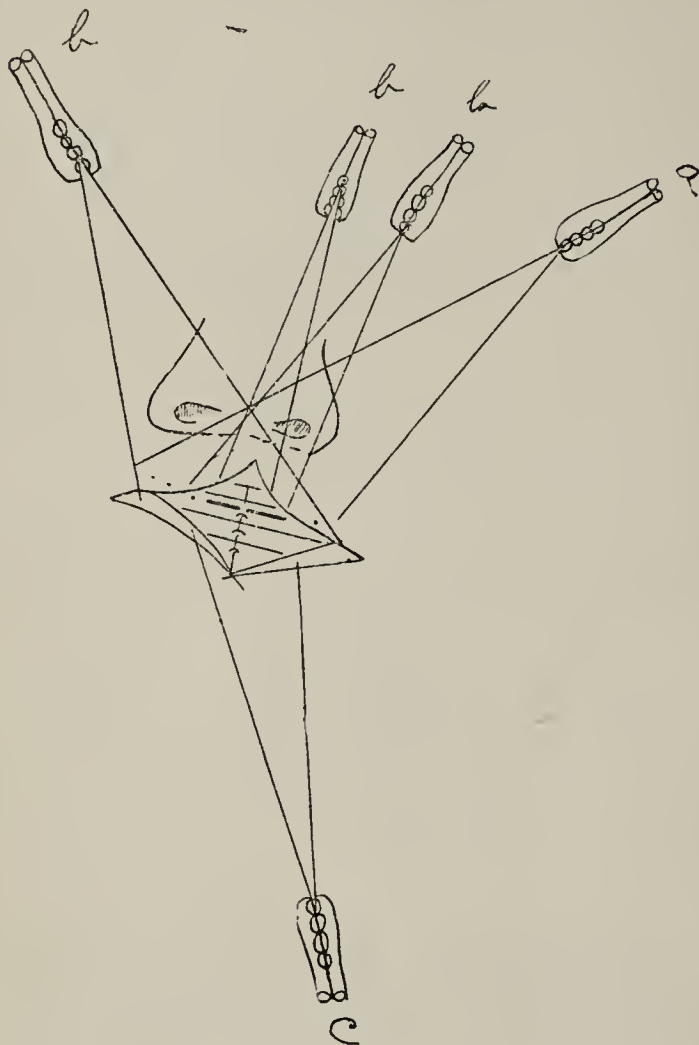


Figure 4.

When the cutaneous sutures are tied, the united wound should present the appearance shown in Figure 5.

4. *Dressing of the Wound.*—After careful cleansing of the line of the wound with saturated solution of boracic acid, a layer of finely powdered boracic acid is dusted on, and a cotton-collodion dressing applied. When I began to use this method I plugged the nostril with borated cotton, but on account of its inconvenience to the patient, have now discontinued this practice. I do not use iodoform-cotton or iodoform-collodion dressing for fear of iodoform poisoning; I prefer to have the nurse or mother dust finely powdered boracic acid into the nostril every three or four hours during the day.

A single or double strip of rubber adhesive plaster, extending from ear to ear, is applied over the collodion dressing in such a manner as to draw the two cheeks somewhat together, for the

purpose of immobilizing the cheeks and lip when the child cries or nurses.

The dressing may be changed once a day, or every two or three days if it remains dry. However, the dressing becomes soaked by nasal secretion, or milk when the child is nursed, and should be changed according to the necessity of the individual case.



Figure 5.

5. *Removal of Sutures.*—The cutaneous coaptation sutures are removed after a week; the tension suture is allowed to remain two to four days longer if it has not been loosened by pressure atrophy, or pressure necrosis of its canal. After removal of the sutures, the borated cotton-collodion dressing and adhesive straps are re-applied to be continued until the suture canal has entirely healed, which takes place towards the end of the second or third week.

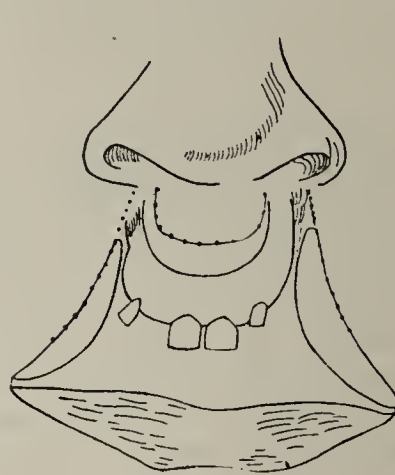


Figure 6.

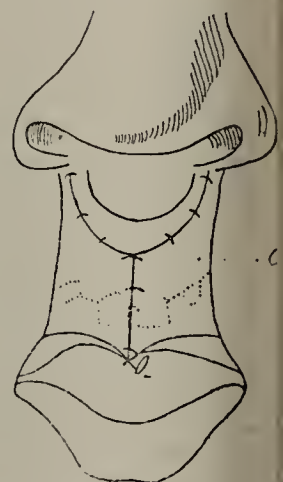


Figure 7.

At the junction of the two lateral corners of the wound there often remains after the suturing a small quadrangular ununited space one to two millimeters in diameter, where it may have been impossible to approximate the edges of the wound. (Figure 5 a.). A very fine suture may help to close this little defect. If, as is often the case, this little suture cuts through, the small defect heals by aseptic granulation, requiring only very little more time than the primary union of the remainder of the wound. It leaves at most a small cicatrix in the line of union of the border of the skin and prolabium, and does not result in permanent disfigurement.

The prolabial sutures will sometimes cut through and peel off if the process of healing goes on undisturbed, or some of the sutures may remain and be removed after the end of the second or third week, at a time when union is strong enough to tolerate the manipulations necessary for their removal.

2. OPERATION FOR DOUBLE AND COMPLICATED HARELIP.

The operation for double and complicated harelip (as represented in Figures 6 to 9), is performed on the same general principles, namely:

1. *Incision.*—The incision along the cutaneo-prolabial border should be of sufficient length to cover the space of defect. A second incision should be made along the cutaneo-prolabial border of the median peninsula of labial tissue below nasal septum, if this peninsula is so situated as to be available for use in the formation of the lip. (See Figure 6).

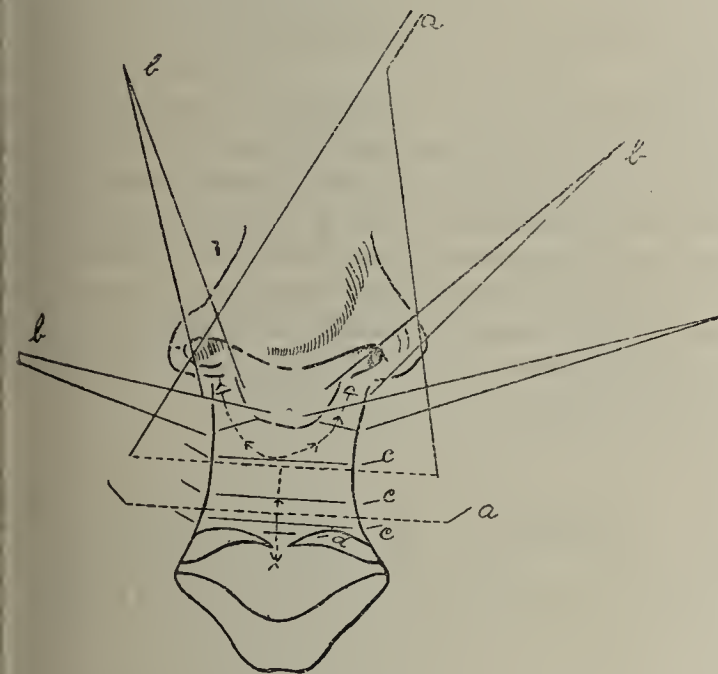


Figure 8.

2. *Suture of the Prolabium.*—The prolabial sutures are applied as just described for the unilateral harelip, to be tied on the oral surface of the wound. The sutures should be first inserted on both sides of the nasal peninsula until this is wholly covered, and until both lateral halves of the prolabium come together at the median point of its lower border. (Figure 7, a.). When this point is reached these two rows of sutures are tied. The lateral prolabial borders are now united in the median line as low down or as far out as required to give to the lip the necessary length, as described in the operation for single harelip. These labial sutures are tied in the mouth usually without any tension, because the prolabium when loosened from the skin and re-inverted, furnishes a flap of sufficient size and elasticity to permit of ready approximation. It is important, as before stated, that the linear

incision should not penetrate into the mouth. When, as is often the case when the cleft extends through the nostril or nasal cavity, there is a lack of prolabium near to and in the nostril, and the prolabial sutures cannot be applied high up, it is usually possible, by careful dissection and separation of the mucous membrane at the oral fornix of the lateral half of the upper lip, to displace the mucous membrane to some extent laterally, so that the uppermost suture may be applied reasonably high up toward the nostril.

When the prolabial sutures have been tied the wound presents the appearance represented in Figure 7.

3. *Sutures of the Skin.*—Tension and coaptation sutures are now applied as follows: (See Figure 8).

1. *Tension Sutures.*—For these sutures somewhat heavier silk should be employed. The upper suture should be inserted at the lower border of the nasal peninsula, the lower one near

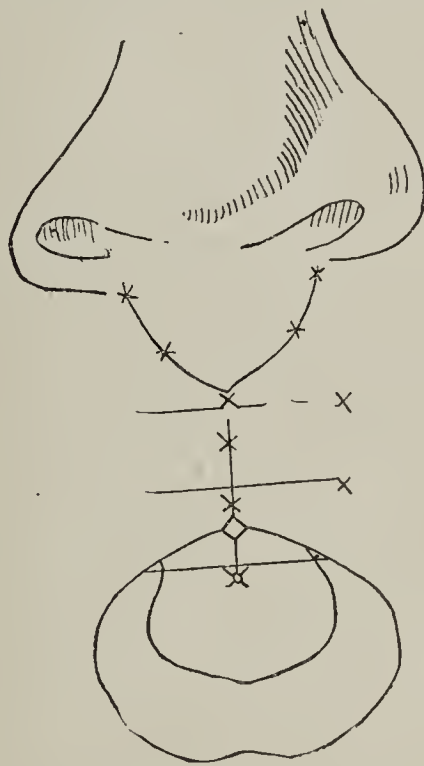


Figure 9.

the lower border of the lip. They should be passed in and out at a distance of a quarter to half an inch of the border of the skin, and should include one-half or a little more than one-half of the thickness of the lip. (Figure 8, a.) The ends should be held by artery forceps, and should not be tied until all the skin sutures have been applied.

2. *Coaptation Sutures.*—The coaptation sutures (Figure 8, b. c.), are now inserted from above downward. The first two or three sutures (Figure 8, b.), are inserted on both sides between the lateral skin flap and the skin of the peninsula, until this is united to the side flap throughout its entire circumference. The lateral flaps, uniting in the median line just below the nasal peninsula, forms the upper portion of a Y-

shaped line of union. Then the lower portion of the wound is united by two or three sutures (Figure 8, c.), and a lower fourth suture (Figure 8, d.) is inserted through the two halves of the prolabium.

After thorough cleansing and disinfection of the wound, the sutures should be tied: first, the tension, and then the coaptation sutures (Figure 7).

4. *Dressing of the Wound.*—The wound should be dressed with borated cotton-collodion, or in older patients, with iodoform collodion. The nostrils, especially in older patients, should be loosely packed with borated or iodoform cotton. Over this two straps of adhesive plaster should be applied. In older patients a strip of iodoform gauze should be laid in the mouth along the line of union of the prolabium. In new-born children the nostrils need not be packed with cotton, and no iodoform gauze should be used; but these localities should be frequently dusted with finely powdered boracic acid. The dressing should be changed according to the amount of discharge, never more than once daily.

5. *Removal of Sutures.*—The coaptation sutures of the skin may be removed at the end of the first week; the tension sutures, according to the amount of tension remaining, usually late in the second week; finally, what may remain of the prolabial sutures should be removed still later, when the union is so solid that the upper lip is able to tolerate manipulation.

It is immaterial how narrow the new upper lip may appear to be immediately after the operation. König remarks (in speaking on plastic operations on the lips—keiloplastic operations following the extirpation of labial carcinomas), that the shape of the mouth, however deformed it may appear, on account of unequal size of the lower and upper lip in the first weeks after the operation, that in the course of some months the shape of the oral orifice and lips becomes more normal, surprisingly so when a sufficient time, from three to six months, has elapsed.

The all-important feature of the operation is to make the upper lip long enough in a sagittal direction, and to have exact union of the lower portion of the prolabium.

Apparatus to draw the cheeks together for the sake of immobilization or to diminish tension, I have, up to this time, found superfluous.

CONCLUSIONS.

The two main points in this harelip operation are the incision and the prolabial sutures.

1. The incision, a linear incision, is similar to that made in the operation for laceration of the perineum as proposed by Lawson Tait, and by him termed "flap-splitting." As stated above, this possesses the advantage of not sacrificing any tissue of the parts already more or less de-

fective; on the other hand, repeated denudations made necessary by unsuccessful attempts at union would tend to make the lateral portions of the lip smaller and smaller. Furthermore, the linear incision, by loosening the everted prolabium (which is readily converted into mucous membrane by the simple change of position into the oral cavity), furnishes so much tissue for the posterior surface of the lip that union of the prolabial borders is easy, even before any tension sutures have been applied.

2. The prolabial sutures should be accurately applied. Fine curved needles should be used, the sutures made of fine silk. Interrupted sutures should be employed, in sufficient number and at sufficient intervals to furnish exact union. These sutures close the wound against the mouth and make the wound, so to speak, cutaneous instead of visceral, and thereby prevent infection from the ever-present multitude of microbes in the mouth. I believe that this suture will prove to be a potent factor in securing uniform results by preventing suppuration and non-union of the wound.

3. The cosmetic results have been all I could desire. If a slight indentation at the line of union of the prolabium has existed immediately after the operation, it has generally disappeared after a few months, provided the lip has been made long enough at the time of the operation.

4. I think that this method is applicable in all cases, and should take the place of all the numerous older methods of operating.

SPRAINS OF THE ANKLE.

Read in the Section of Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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There is a popular impression among many of the laity "that a sprain is worse than a fracture," yet, to judge from the amount of space devoted to the subject in our text-books on surgery, it is evident that their authors do not agree with the statement. We must, however, admit that some grounds exist for the belief, and that, while we seldom hear of an ununited fracture, or of a fracture causing trouble years after the original injury, we are constantly meeting with cases of chronic sprain of the ankle, of flat foot, of various forms of bone and joint disease which we can clearly trace to a sprain. Several reasons exist for this state of affairs, and in many instances the reason may be clearly shown to be the faulty or neglected treatment of the original injury.

Mr. Mansell Moullin, of London, in his most thorough and interesting monograph on "Sprains

their Consequences and Treatment," says in his Introduction: "Few injuries are treated with so little consideration as sprains. It is impossible to overlook wounds, owing to the bleeding and pain which accompany them. Fractures, it is understood, require rest and care; but sprains, in which the tissues are torn to such a degree that the damage is far more serious than in many fractures, merely because they are so common, are considered of little or no consequence. It counts for nothing that the part injured is one of the most complicated structures in the body, and particularly liable to inflammation from the constant use to which it is subjected. Yet a fracture is regarded as very serious, a sprained joint as quite a trivial matter." Other authorities could be quoted to show that sprains in many cases receive little or no treatment; the patient is dismissed with the statement that it is only a sprain; bathe it in hot or cold water, or rub a little arnica or Pond's extract on your ankle. Nothing more is thought of the case, and years afterwards, the original injury having almost been forgotten, the sufferer applies to some specialist for treatment.

This state of affairs is very graphically described by Royal Whitman, M.D., in an article read before the American Orthopædic Association in 1890, on "The Treatment of Persistent Abduction of the Foot, commonly known as Chronic Sprain of the Ankle." He says: "The successful treatment of any chronic affection demands a personal, persistent attention to details on the part of the surgeon. This is particularly true of the treatment of what are known as minor injuries, and therefore neglected. One of this class, commonly known as chronic sprain of the ankle, may entail years of discomfort and disability, with permanent impairment of the functions of the foot. The usual history of such cases is as follows: Long-continued weakness and discomfort, following an injury to the ankle, treated by various physicians with liniments, blisters and bandages, until the discouraged patient is told that nothing more can be done, but that his symptoms 'will wear away in time.' A year or two later he presents himself, usually for the purpose of securing a brace, or for some peculiar shoe which he thinks may be of service to him."

I have quoted thus at length, because it is my firm belief that most of these disagreeable after-effects can be avoided, if the patient and surgeon will simply recognize the fact that every sprain, no matter how trivial, is worthy of treatment.

The prevention of a flat foot is easier and more satisfactory than its treatment, and a large number of the cases have their origin in a simple and neglected sprain of the ankle. The same is true of bone lesions, and if the injury is recognized, and its importance admitted, many cases will

thus be saved from the unpleasant symptoms, so common, as the result of the practice of considering sprains as slight and unimportant injuries.

The definition of a sprain as given by Webster—the weakening of the motive power of a part by sudden and excessive exertion—describes both the manner of production of the injury and the result produced, but a more accurate and better definition is that given by Mr. Edward Cotterell, in his little book on "Some Common Injuries to Limbs." He says: A sprain includes all injuries to a joint and its surrounding structures produced by a sudden twist, but stopping short of dislocation.

Many degrees of severity may exist, and the classification adopted by S. L. McCurdy, M.D., in an article on "Sprains and their Treatment," which appeared in the *Columbus Med. Journal* for January, 1891, is a very good one.

He divides them into three classes. In the first there is simply a contusion of synovial membrane and a stretching of the soft parts; in the second there is a rupture of the ligaments and synovial sac; and in the third "sprain fracture"—the ligament, instead of tearing, pulls off a thin layer or slice of bone. This accident, though infrequent, perhaps might best be considered under the head of fractures.

A better method of studying the cases, seems to me to be that adopted by Mr. Moullin in the monograph previously alluded to, and its perusal will repay those interested in the subject.

He discusses the effect produced on each tissue by such injuries, and the mutual sympathy of all the parts. The ankle-joint is particularly liable to sprains, its normal movements being flexion and extension, in alighting upon uneven surfaces, whether from a height or from some moving body, as a car, wagon, etc., unless the foot is evenly placed, the weight of the body being suddenly thrown on the joint, causes the foot beneath it to twist, and a violent wrench or sprain ensues. Severe pain is felt, in most cases limited to the parts near the ankle, in other cases extending up the limb. In the most severe cases, a condition of shock may even result, and the entire nervous system apparently becomes deranged.

Moullin says: The pain when ligaments are torn is usually described as sickening in character, and those who have once felt it, rarely fail to recognize it a second time. If a muscle is strained, there is generally a peculiar sensitiveness of the skin, most marked over its points of attachment to the bones or tendons. Slight touching of the part may cause exquisite pain, yet firm pressure may be well borne.

When the muscle is torn across, either partially or wholly, there is a sharp pain, like that of a blow with a whip or a cricket ball, so that the patient may turn around to see who has struck him before he is aware anything has given way;

and then, as the swelling begins, this is followed by a feeling of stiffness and soreness, severe even when the limb is at rest, but so much worse when an attempt is made to use it, that the patient can often hardly be induced to try. Similar pain occurs when a muscle is dislocated, and after the restoration there remains a sensation of soreness, with a tender spot corresponding to the slip displaced. These tender spots may remain for a long time in the ankle, if a lateral ligament has been torn away from the bone—but allowance must be made for those that are normally present when a joint is hurt. What they are caused by is not always certain, but as a rule they correspond to points where the capsule is thin and flexible and not far removed from the surface, so that pressure falls directly on it. At the ankle there is generally one on the front of the joint, rather to the outer side of the middle line.

Swelling more or less severe follows. The joint may become distended with synovial fluid, or blood may become extravasated into it. The appearance of the swelling may be very rapid, in many cases extreme, and followed by inflammatory symptoms—increased local temperature and redness, later on perhaps followed by an increase of the body temperature, if the inflammation be very severe. Motion of the affected joint may be slightly diminished, or even entirely lost, spasm of the muscles in proximity to it occur, and motion is thus limited, or the patient may voluntarily contract the muscles, from fear of being hurt, and thus produce spasm. Staining occurs at or near the site of injury, due to the extravasated blood, the color varying according to amount extravasated and the time it is seen after the infliction of the traumatism. If the bursa is injured, a teno synovitis or bursitis may follow, characterized by the presence of fluid in the bursal sac, and in some cases, later on, by adhesions. The close resemblance of these sprains to many dislocations is clear when we recognize, as was done by Vidal de Cassis, that they are really the same thing, only that reduction has taken place spontaneously.

Having thus briefly considered the pathology and symptoms, the question of treatment should not be a difficult one.

If we recall the anatomy of the ankle, we find that it is superficial, not covered with much fatty or muscular tissue, surrounded by ligaments and tendons, and that the latter have reflections of the synovial-like membranes from their sheaths, forming bursæ. The indications are to give the injured parts support and rest, restore the joint functions and prevent inflammation.

It is of course understood that a careful differential diagnosis must be made. The sooner the case is examined after the injury the better. Fractures and partial dislocations, bone or joint disease, must be carefully excluded.

If any doubt exist, give the patient the benefit of that doubt. Do not hesitate to give an anæsthetic if, for any reason, careful and satisfactory examination cannot be made without it. This is of great importance from a medical as well as a legal standpoint, as a case of Pott's fracture or fracture of tibia, fibula or tarsal bones, if treated as a sprained ankle, might cause serious trouble. These mistakes should and can be avoided. When the lesion has become chronic, the diagnosis is often difficult, and bone disease is easily mistaken for chronic sprain of the ankle, but we are supposed to be dealing with the acute or recent cases. How best to fulfil the indications of treatment depends somewhat on the individual case and the facilities at hand. Rest of the part with preservation of its function, seems to me best accomplished by means of a dressing of adhesive plaster which I call the Cotterell dressing, as Mr. Cotterell was the first to use it in sprains of the ankle, although the idea was suggested to him by Mr. Wharton Hood (*Lancet*, Vol. ii, 1884, p. 728), for the treatment of what is known as lawn tennis leg. The limb is elevated, to assist in reducing the swelling, then strips of adhesive plaster, each $1\frac{1}{2}$ inch in width, and of the length adapted to the foot and ankle joint, are applied, somewhat as strapping is applied in the treatment of chronic ulcers of the leg. It is not advisable to use strips narrower than one inch, as they may cut the parts by a curling up of edge of the plaster. Over this a firm roller bandage is applied, and the patient is directed to get up and walk. The adhesive plaster causes a firm and even compression of the parts, acts as a light splint, prevents exudation and permits motion, which in the mild cases is desirable. The patient may come into the office limping and heavily leaning on a cane, and yet after the application of this dressing, if he is once persuaded that motion will not injure his joint, he is enabled to dispense with the cane, and in a short time walk with comfort. In one case a policeman weighing 280 lbs., although he had not stepped on his foot for three days after a severe sprain of the ankle, was enabled to return to duty within six hours after its application. This treatment is recommended where the injury simply consists in a wrenching of tissue and a contusion of synovial membrane.

In the more severe injuries, when ligaments are torn across, muscles ruptured, synovitis or bursitis present, the parts should be strapped, and then foot and ankle encased in a plaster of Paris or silicate of soda splint. Care should be taken that the foot be put up at a right angle with the leg, and in a position of varus, not of valgus. The strapping in all cases should be renewed in a few days, as, when the swelling subsides, it becomes loose. The plaster of Paris must not be left on too long, as when acute symptoms subside motion is desirable, to prevent adhesions

and stiffness of the joint. If extreme swelling or inflammation have occurred before case is seen, then heat, cold, the various antiphlogistics, may be used, and after these massage and electricity. Support is needed as long as there is swelling or marked tenderness.

It is not intended in this paper to discuss the subject exhaustively, but rather to call attention to the fact that sprains of the ankle, even of slight degree, are worthy of careful treatment, and that, in my opinion, the Cotterell dressing is the best form of treatment in the mild cases, and the Cotterell dressing and plaster of Paris in the more severe.

THE RELATION OF CALCULI TO MALIGNANT DISEASE OF THE LIVER AND KIDNEYS.

Read in the Section of Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5-8, 1891.

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Since it has become the established surgical method to explore the abdomen in case of doubtful diagnosis, we have definite scientific knowledge, which can often be used for the well-being and safety of the patient while alive, instead of merely adding to our stock of post-mortem information. Among other beneficent results to which we have fallen heir is the improved surgery of the liver and kidneys. In the performance of these operations, many surgeons have noted the frequency of the correlation of biliary and renal concretions with malignant disease. The following case will illustrate the subject to which I desire to direct attention in the present paper.

Mrs. —, age 65, had from time to time for six months before my attention was called to the case, attacks of biliary colic. Her physician had given the usual treatment, such as olive oil, etc., with the alleged result of causing the evacuation of several "rather soft" gall-stones. (I have never had any reason to think olive oil any better drug than any other substance capable of being saponified, or otherwise causing fatty or soapy masses to pass per anum resembling gall-stones).

At last, after much delay, and the advent of grave symptoms of collapse, the patient was referred to me for operation. There was slight jaundice, the urine highly colored with bile, and the usual stools seen where there is absence or deficiency.

There was some enlargement of the liver just over the gall-bladder, and some emaciation of the patient. Diagnosis, gall-stones, with probable malignant disease. The operation was a very simple one. As soon as the peritoneum was opened, and before a sponge could be securely placed in position, an abscess opened and poured

out two or three ounces of offensive pus. The malignancy was beyond doubt, and quite a number of gall-stones were quickly removed, although no time was lost in searching for them. The peritoneum was stitched to the abscess wall, thus securing the peritoneal cavity from infection for the time, and a drainage tube and dressing completed the operation. The patient was quite comfortable after the operation, not even requiring morphia, as she had done previously. She lived very comfortably for three weeks, and died of uncontrollable hæmorrhage from a vessel deeply seated in the liver. This case, and several autopsies where a similar condition was found, have led the writer to a study of these phenomena, and the points at issue are these:

Are calculi a cause of malignant disease, or are they a result?

Is their presence merely a coincidence?

Or are calculi very often present without giving rise to symptoms, or disease, and only found post-mortem?

It is quite possible that vague and indefinable symptoms, very often reflex in their manifestations, leave us in doubt as to their significance.

That there is an element of truth in all these statements is beyond question. It has been shown by several authorities that the kidney is not so frequently invaded by malignancy as a result of calculous disease as is the liver. For instance, Ralfe gives "renal calculi" a cause of cancer, as we often find renal concretions in cancerous kidney, though it is certainly not such a frequent clinical sequel as is the case in biliary disease.

A clinical instance is given by Dr. Norman Moore (*London Path. Soc. Rept.*, 1882); also an instance by Mr. Pollard in same Trans. for 1885 (*Ralfe, Dis. of Kidney*).

In St. Bartholomew Repts. we find, Vol. XXI, a case reported of nephrolithotomy for calculous pyelitis, and after death not only an abscess, but epithelioma, was found, which was produced by the irritation of the calculus (*Newman, Surg. Dis. Kidney*).

The writer has notes of one case of chronic Bright's disease in which, at the autopsy, several calculi were found in one kidney. No positive symptoms of stone were recognized during the patient's life.

Dr. Bright early recognized the coexistence of renal calculus and cancerous disease. One report shows the finding of a lactic acid formation in one kidney, and an oxalic stone in the other.

Another case mentioned by Brodeur (*p. 170, Newman's Dis. Kidney*): A female, æt. 36. R. Kidney tumor removed by abdominal method. "Patient died in two days. Weight of tumor, 1 lb. Pelvis and calicis contained calculi, although the microscopist said the disease began in the epithelial lining of the renal tubules."

Epithelioma appears to most frequently follow this form of irritation ; at least, more frequently than other forms of cancer.

If evidence is given that the kidney is probably the seat of cancer as a result of calculous irritation, we are abundantly able to show that the liver is much oftener attacked by malignant disease than these organs. In Guy's Hospital Reports for 1875, Dr. Hilton Fagge reports forty-two autopsies, covering a space of fifteen years, showing an intimate correlation of calculi and carcinoma. He says: "But the way in which death is most frequently brought about in persons who have gall-stones is by the development of cancer about the gall bladder or the bile ducts. Within the period of twenty-one years already referred to there have been at least twelve cases in which gall-stones being present, there has been likewise malignant disease of these structures. In some instances, the clinical history has pointed distinctly to the view that the jaundice was originally due to an ordinary attack of biliary colic, and that the development of cancer was secondary. Indeed, one case seems to admit of no other interpretation. (The case is given at length.) But in the great majority of cases in question, no gall-stone has been impacted in the duct at the seat of the cancer. The concretions have been found in the gall-bladder itself, which has often contracted round them, and empty, or containing only a little purulent mucus. Thus it appears probable that if the malignant growth had not developed, all the symptoms would have subsided, and the health of the patient would have been restored. All observers, indeed, are not agreed that the cancer of the bile-ducts arises secondarily when it is found in association with gall stones. It has been urged that the gall-stones are often discovered in the bodies of those who have died from cancer of the breast or of other organs. This may be merely a coincidence, for both cancer and gall-stones are especially apt to occur in persons advanced in life. However, even if some deeper relation than at first sight appears probable should be proved to exist between the formation of biliary calculi and the development of cancer in the body generally, this would not do away with the clinical significance of the facts stated above ; it would still remain true that when a patient who has had attacks of biliary colic dies of protracted jaundice, the ducts are almost invariably found to be affected with cancer." . . . "Statistics show the jaundice as a symptom of cancer is just twice as frequent as owing to gall-stones." Dr. Markham (*Harley, Dis. Liver*) reports a case which was supposed to have been pyloric disease. Patient, age 28. Intense jaundice ; pain ; vomiting after eating ; urine deeply colored with bile ; no bile in stools. At autopsy the gall-bladder was found converted into a large and solid mass of scirrhus, which

commenced in the coats of the viscus itself. In the center of the mass was found a number of gall-stones, which were supposed to have to do with the formation of the cancerous deposit.

Dr. Coupland (*Trans. Path. Soc., Lond.*) reports another case in a woman, æt 56. A large number of calculi were found in the center of a malignant tumor. Dr. Harley mentions another case reported by Dr. Norman Moore, occurring in a woman aged 59. One case appears to have been attributed to the operation of gastroenterotomy.

Harley says (*Dis. Liver*) : The liver and gall-bladder are alike subject to irritation and cancer resulting from gall stones. Gall-stones apparently, indeed, not only give rise to serious organic changes in the wall of the viscus, such as inflammatory thickening, and hypertrophies, but to the formation of new growths in the shape of benign, scirrhus and malignant encephaloid tumors. After mentioning a case of acute yellow atrophy of the liver, associated with biliary calculi, Murchison says, p. 271, ed. 1877 : "It is remarkable that most of these cases (alluding to secondary cancer of the bladder from extension of the disease from liver and pancreas, more commonly commencing in the gall-bladder, and secondarily affecting the liver and peritoneum), the gall-bladder contains calculi, and the cancer appears to be the sequel of gall-stones. Not infrequently there is a history of biliary colic. (P. 372). The passage of a gall-stone, with or without hæmorrhage from the bowels, concurring with a tumor, would corroborate rather than refute the diagnosis of cancer." Murchison gives histories of cases in support of this opinion. These cases support the view announced by Dr. Fagge, "that there is frequently a history of biliary colic preceding the onset of cancer."

Authorities differ greatly upon the question of the relation of carcinoma to gall-stone formation. Until recently, most observers were inclined to look upon the cancer, or the cancerous diathesis, as the cause rather than the effect of the calculi. Several recent clinical observations would appear to confirm the belief that calculi may be the irritating cause in some cases. Quetsch (p. 39) relates the history of a female patient who had a biliary fistula opening upon the surface, the result of a long-standing calculous disease. Some of the calculi did not pass through the fistula, and carcinoma of the gall-bladder, which developed, was attributed to the irritation produced by their presence in the organ. The article in *Buck's Ref. Hand-book Med. Sci.* clearly favors the above view. Frerichs notes the coincidence of cancer of the biliary system and calculi, having, in eleven cases, found calculi nine times. This subject has claimed some attention from clinicians and pathologists for many years, but there are few, if any, authors who have attempted

to collect a résumé of the literature of the subject.

Dr. Arthur Willigh (*Virchow's Arch.*, 1869) reports one case. A writer in the *Bulletino delle Scienze Mediche di Bologna*, 1871, adds his voice in favor of the above views, and gives a case occurring in a woman aged 48. Dr. Kraus, of Carlsbad, mentions a case of primary cancer of ductus cholodochus produced by the wedging of several stones in the canal. (*Prag. Med. Woch.*, 1875.) Dr. Harley mentions one reported by Dr. Vanderbye. (*Path. Soc. Trans.*, 1858.) A woman, age 64, having extreme liver disease of malignant character, with neither jaundice nor anasarca, and with forty gall-stones in her gall-bladder.

The fixed idea that injuries of the liver may cause the development of cancer, if true, gives color to the possibility of cancer being caused by calculi. Harley strongly presents this view, that either injury or irritation of the nerves or tissue of the liver is a far more frequent cause of its malignant degeneration than the majority of physicians suppose. Just here I would mention that, as it is generally supposed that jaundice is nearly always present in malignant disease of the liver, statistics seem to show that in only a small proportion of all cases is it present save in last stages of the disease. It is also further worthy of remark that many cases of gall-stone are present with jaundice without cancer in proportion of two to one. Among American writers I find but little said upon this subject. Dr. Ransdorf and Dr. Musser, of Philadelphia, are exceptions; both indorse the views of authorities quoted in this paper. In closing, I do not think it important to comment upon the remaining phases of the question as to the cause of cancer, as, for instance, the cachexia of cancer favoring the formation of gall-stones. The study of reported cases shows plainly the deposit of cancer formation as a result of mechanical irritation, of which there are instances in other parts of the body. We have not lost sight, however, of the possibility of cancerous obstruction adding to the possibility of calculous formation, although we incline to the idea that the slow formation of calculi must date far beyond the period when the fatal obstruction from cancerous deposit occurs.

(Note.—Since the meeting of the Association, the following notes have been prepared, to be added as a postscript):

W. H. Larmond, in *Le Prog. Medical*, 387, 1882, reports a case of biliary calculus, grave icterus, and cancer of the liver. Patient's age, 75. Several calculi size of filberts.

H. Zenker, *Deut. Arch. f. Klin. Med.*, Band xiv., says of the method of transformation to cancer: "The malignant process in these cases starts in much the same manner as does a cancer of the stomach from the edges of a benign ulcer."

Zenker was able to find, on microscopic examination, that cicatrices of the gall-bladder, caused by the presence of gall-stones, were accompanied by an outgrowth of epithelium not only from the gall-bladder, but in the adherent parts, such as the transverse colon, or the common bile-duct. Where the points of transmission lie between such a typical epithelial growth and the commencement of actual cancer it is not possible to say. The author holds that the passage from one to the other is gradual, and that old age is a predisposing cause.

In *Trans. Med. Soc., Lond.*, vol. xli., 1889-90, p. 40, Dr. H. Handford communicates an interesting history of a female patient, age 55, who had cancer of the portal fissure of the liver, jaundice, impacted gall-stones, combined with interstitial hepatitis (atrophic cirrhosis). Very many gall-stones were found in this case. The points of special interest were these:

1. The association of carcinoma with impacted gall-stones. The author well says: "This is not very rare, although not so common as the association with non-impacted stones."

2. The presence of multiple strictures of the intestine. Neither excision of the rectum or inguinal colotomy would have given much relief in this case, because of the obstruction higher up.

3. The association in the liver of interstitial hepatitis with disseminated carcinoma.

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SUPRA-PUBIC CYSTOTOMY.

Read in the Section of Surgery and Anatomy at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY JOHN A. WYETH, M.D.,
OF NEW YORK.

The personal experience upon which this report is based embraces twenty-three operations, in all of which recovery ensued. They may be, for purposes of study, divided into:

- | | |
|---|-----------|
| 1. Tumor of the bladder | 6 cases. |
| 2. Tumor of the bladder, with stone | 2 " |
| 3. Stone (without tumor) | 3 " |
| 4. Foreign body | 1 case. |
| 5. Cystitis, without tumor, stone or foreign body (one case with fistula) | 11 cases. |

23 cases.

I. TUMORS.

Case 1.—Male, aged 40. Operation July 7, 1888. Seven months before, hæmaturia, chills and fever. Diagnosis, cancer of bladder. Large epithelioma removed. Drainage tube removed eighth day. Urine ceased to escape through wound on sixteenth day. Recovery. Improved. Six months later, death from general metastasis and exhaustion.

Case 2.—Male, 36 years old. Operation July

20, 1888. Small benign sessile tumor removed from floor of trigonum. Drainage tube removed sixth day. Wound closed on eighteenth day. Recovered. Cured.

Case 3.—Female, 20 years old. Small, pedunculated, benign tumor at commencement of urethra, forming ball-valve, and stopping free outflow of urine. Operation March 26, 1889. Wound in bladder closed at once. Catheter per urethra ten days. No leakage. Recovery.

Case 4.—Male, 54 years. Operation October, 1889. Tumor of bladder just behind urethral opening removed (third lobe of prostate). Drainage for eight days, and wound closed. Recovery.

Case 5.—Female, 42 years. Operation December, 1889. Valve like fold of hypertrophied or thickened mucous membrane partially closing outlet of bladder. Removed. Wound in bladder closed at once by suture. Recovery. Cured.

Case 6.—Male, 62 years. General hypertrophy of prostate, enlargement of middle and both lateral lobes, chronic cystitis for three years, and with partial paralysis of bladder from over-distension. Operation November 12, 1890. Recovered, much improved. Permanent drainage necessarily established.

2. TUMORS COMPLICATED WITH CALCULUS.

Case 1.—Male, 67 years. Operation September 4, 1888. Tumor of prostate and calculus removed. Tube removed sixth day. Wound closed by sixteenth day. Recovery. Cured.

Case 2.—Male, 48 years. Operation September, 1889. Tumor and calculus removed. Drainage for about ten days. Recovery. Cured.

3. STONE UNCOMPLICATED EXCEPT WITH USUAL CYSTITIS.

Case 1.—Male, 46 years. Operation September 28, 1888. Large stone removed. Tube discontinued eighth day. Fistula persisted for four weeks. Scraped this out and it then closed. Recovery. Cured.

Case 2.—Male, 60 years. Operation December, 1889. Piece of catheter four inches long, thickly incrustated with urine salts, removed. Tube discontinued fifth day. Recovery. Cure.

Case 3.—Male, 16 years. Operation March 9, 1890. Oxalate of lime stone about one inch and a half in diameter removed. Drainage five days. Wound closed on fifteenth day. Recovery. Cure.

4. FOREIGN BODY (UNCOMPLICATED).

Case 1.—Male, 41 years. Operation July 25, 1888. Piece of metal catheter removed. Tube discontinued fifth day. Wound closed fourteenth day after operation. Recovery. In this case, immediate suture would have been permissible.

5. CHRONIC CYSTITIS WITHOUT TUMOR OR STONE.

Case 1.—Male, 40 years. Operation Decem-

ber, 1888. Drained three weeks. Wound closed gradually. Recovery.

Case 2.—Male, 68 years. Old persisting fistula from former operation with cystitis. Fistula opened up; scraped out; wound allowed to close. Recovery.

Case 3.—Male, 54 years. Cystitis after previous operation. Usual drainage. Recovery.

Case 4.—Male, 4 years. Cystitis, with paralysis due to compression of cord. Tube removed fourteenth day. Wound closed gradually. Recovery.

Case 5.—Same patient. Drainage reëstablished by operation, and prolonged. I opened the spinal cord, evacuated abscess of the cord, and cured the paralysis in this case. Recovery.

Case 6.—Male, 24 years. Cystitis for eighteen months. Operation March 14, 1890. Drainage three weeks. Recovery.

Case 7.—Male, 36 years. Cystitis for one year. Operation March 28, 1890. Drainage two weeks. Wound closed in four weeks. Recovery.

Case 8.—Male, 58 years. Impermeable stricture of urethra and cystitis. Drainage for six weeks. Patient had cerebral hæmorrhage, and died eight weeks after the operation from compression of brain. Cystitis was cured at time of death.

Case 9.—Male, about 45 years. Complete paralysis of bladder, and cystitis. Permanent drainage. Recovery.

Case 10.—Male, 59 years. Chronic cystitis and neuralgia of the vesical neck and prostate. Operation January 28, 1891. Drainage tube removed fourteenth day. Small area of thickened mucous membrane over trigonum removed. Wound closed gradually. Cystitis relieved. Neuralgia not benefited, and patient, May 5, 1891, at home, but still a sufferer from prostatic neuralgia.

Case 11.—Male, 63 years. Operation March 9, 1891. Tube removed fourteenth day. Wound about closed April 22, when patient was last seen. Recovery.

The operative technique is as follows:

The preparatory treatment consists in emptying the alimentary canal by laxatives and enema. The pubes and perineum should be shaved before the anæsthetic is given. After narcosis is complete, the patient should be placed on the back, the pelvis about six inches higher than the head, so that the contents of the abdomen may gravitate toward the diaphragm. A soft catheter is inserted, and the bladder filled with eight or ten ounces of warm Thiersch's solution, which is allowed to flow out through the catheter, and this is repeated until the fluid escapes fresh and clear. Finally, about ten ounces of this solution are injected, the catheter withdrawn, and the urethra closed by ligation of the penis with rub-

ber tubing. In females the bladder is kept full by digital pressure of the urethra against the arch of the pubis, or by plugging.

In cutting into the bladder, the point to be made for is the upper surface of the symphysis pubis. The incision usually extends about two inches above and an inch below this point. In very fat subjects it may be more extensive. It should be exactly in the median line, through the skin and muscles. It is usually an advantage to snip the muscles from the upper margin of the pubic bones for a half inch on either side. In case a large tumor or stone is encountered, this lateral incision may be enlarged to within one-half inch of the inner pillar of the external abdominal ring. The supporting power of the muscles is not permanently impaired by this section, which is best made with curved, dull-pointed scissors, and by cutting close to the bone all bleeding may be avoided. By retraction of the parts divided, a varying quantity of fat (the pre-vesical fat) is encountered lying on the anterior wall of the bladder and in contact above with the inferior fold of the peritoneum. With the finger nail (or, if necessary, the dull scissors) this fat is separated from the slight attachment to the inner surface of the ossa pubis, and also lifted upwards by the same means from the anterior bladder wall. In this manner the bladder is exposed for about two inches in its perpendicular axis, and the peritoneal fold is carried up with the fat, and is, as a rule, not seen. Only once or twice have I seen the peritoneum in my operations. The bladder is now in plain view, and the line of incision into the viscus is in sight. If any large veins are seen, and these are so located that their division is unavoidable, they should be tied with catgut passed beneath them, but not into the cavity of the bladder, by a small, curved Hagedorn needle. In order to keep control of and to support the bladder after its contents escape, and to serve as a guide to the introduction of the finger or any instruments, on either side of the proposed line of incision, a silk thread is inserted into the wall of the bladder by means of the Hagedorn needle. The thread being inserted, the needle is unthreaded, and the ends tied about one foot from the wound, leaving a movable loop. Everything is now ready for cutting into the bladder. A long, blunt retractor should be inserted on either side to hold the soft parts back, while a third shorter one draws the pre vesical fat apart, and with it the peritoneum. The silk loop being sufficiently tightened, a short knife is carried, the back downwards, in contact with the inner surface of the ossa pubis, until the point strikes the bladder about one-half inch below the level of the symphysis, when it is pushed through the anterior wall, which is rapidly incised in the median line upwards for one or two inches. As the injected solution escapes,

the finger is introduced and a thorough exploration effected. If for any reason the bladder is deeply sunk in the pelvis, the Barnes dilator may now be inserted per rectum, filled with 4-5 ounces of warm water, and by this means the floor of the bladder is lifted toward the wound. I have not had to resort to this expedient in more than three instances.

If a stone or foreign body is present, it may be removed with a light forceps or the finger. I find the index finger answers better than any instrument. When a tumor is present, it is easily recognized by the touch. The most satisfactory instrument for removing tumors of the bladder is a small fenestrated Spencer Wells ovarian sac clamp, the teeth of which have been filed off. With the finger tip resting on the tumor, the instrument is carried down with one jaw on either side of the finger until it slips from the finger tip on to the neoplasm. It is then pushed snugly on to the mass, the jaws closed, and the instrument twisted around and around until the tumor is twisted off. Any particles which may remain are in like manner removed. The retractors are now carried into the bladder, and thus stretching the wound wide open, will permit thorough sponging of the cavity and an ocular inspection of the walls. The Pacquelin cautery point may now be introduced, and the base of the neoplasm seared over. While this is not essential in ordinary prostatic hypertrophy of the middle or lateral lobes, it is imperative in malignant neoplasms and in papillomatous growths. If hæmorrhage is severe, it may be controlled by compression with warm sponges, or by water at 110-115° F. The after-treatment of the bladder will depend upon the condition of this organ. In all cases where cystitis exists from stone, foreign body, tumor or other cause, drainage is indicated, and, of course, where the urethra is impermeable or the bladder paralyzed, it is imperative. When no cystitis is present, it is advisable to close the wound in the bladder wall at once.

In only two of the twenty-three operations was an immediate suture undertaken, and in these cases the wound closed promptly without leakage. Both were in women.

A short, curved, small Hagedorn needle is armed with small, firm catgut (juniper oil gut is preferred). The edges of the incision in the wall of the bladder are brought up into the incision through the abdominal wall by traction on the silk thread already introduced, or by tenacula, and the sutures introduced in this manner. About $\frac{3}{8}$ of an inch from the edge of the incision the needle is carried into the wall of the bladder—not through it—and is made to emerge on the cut surface just where the mucous membrane rests on the muscular layer. It enters on the same level on the opposite side, and is carried out at the same distance from the edge of the

incision. The space between the sutures is from $\frac{1}{8}$ to $\frac{3}{16}$ of an inch. When all are inserted, they are tied and cut $\frac{1}{2}$ inch from the knot. The abdominal wound may now be stitched a short distance from its upper and lower angles, but as much as corresponds to the line of sutures in the bladder, is left open. A careful disinfection is now made, and the wound snugly packed with iodoformized gauze; bi chloride dressing over all. Should leakage occur, the open wound prevents all danger. A soft catheter should at once be inserted into the bladder by the urethra, and tied in. After three or four days, should irritation of the bladder or urethra supervene, it may be removed and reinserted at intervals to draw off the urine. In from seven to ten days the wound will be united sufficiently to permit the patient to empty the bladder at will. It is of great importance, however, that no urine should be allowed to accumulate within the first three or four days for fear of separating the edges of the wound.

In the majority of cases operated on, I have employed temporary drainage, and in two cases permanent supra-pubic drainage was established.

Temporary drainage is very satisfactorily secured by the Trendelenberg T tube, made of ordinary white rubber drainage tube, with a lumen of about $\frac{1}{4}$ of an inch. This tube is about ten inches long, one end being carried through a split in the center of a smaller piece of tubing about two inches in length, which is securely stitched to the larger piece. A single good-sized hole should be cut in the larger tube just at the level of the cross-piece. In inserting this tube, the cross-piece or top of the T should be folded back in the jaws of a pair of dressing forceps, and carried down to the bottom of the bladder, when, on loosening the forceps, the cross piece springs out and prevents the dislodgement of the tube. A final flushing of the bladder with boro-salicylic solution is now made, and the wound about the tube snugly packed with iodoform gauze. In doing this, while the tube should not be closed by pressure of the packing, it should be tight enough to keep air out of the bladder so the siphon-action of the tube may not be interrupted.

A smooth, well-adjusted piece of glass tubing about four inches long is now inserted into the rubber tube, and to this a long piece of rubber tubing is attached, the end of which leads into a vessel beneath the bed. To start the siphon-action the tube needs to be partially filled with water, after which the end is lowered, the water flows out, and the contents of the bladder follow. The outflow can be regulated by compression of the tube with a safety-pin, so that it falls into the vessel drop by drop just as fast as it is discharged into the bladder from the ureters. The patient for the first few days rests upon the back. The coil or loop of the drainage tube should be

secured to the dressing and the edge of the bed by safety-pins, so that it may not drag upon the wound. Should the tube become displaced, it may be reinserted, using the two silk loops left in the wall of the bladder on either side of the wound as guides.

Properly managed, the drainage by this method is perfectly satisfactory. I have had patients thus treated in whom the dressings did not get wet or have to be changed oftener than once in four or five days. There is no need, in my opinion, of an additional operation through the perineum to secure drainage by gravitation. At least, I have not felt the need for this method in any of my cases. The length of time the tube remains in the bladder will, as has been said, depend upon the condition of this organ. When the operation is done for removal of recent foreign body, or of a small tumor which has not caused cystitis and does not bleed much after removal, immediate suture of the bladder is indicated. When only moderate cystitis exists, should the urine clear off nicely in from three to seven days, the tube may be withdrawn. When this is done, a loose dressing of gauze and cotton is laid over the wound to absorb the urine which wells out. This will have to be changed at frequent intervals. In a few days the urine will partially flow out through the urethra, and by the end of from two to six weeks all will be discharged by the natural way.

Occasionally a small fistula may persist, which will require either to be packed with iodoformized gauze or scraped out with a Volkman's spoon to insure its closure. In paralysis of the bladder, and in certain cases of obstruction either in the urethra or by hypertrophy of the prostate in which the bladder has lost so much of its tone that it can only empty a portion of its contents, leaving the remainder to press upon the rectum and to produce cystitis and discomfort, permanent supra-pubic drainage is indicated. This is best accomplished by a velvet rubber catheter arranged so that the eye-end, passed through the wound, rests easily upon the floor of the bladder. On the skin at the outer end of the fistula rests a shield of soft rubber, about $\frac{3}{16}$ of an inch in thickness and $1\frac{1}{2} \times 3$ inches surface measurement. It is held firmly in place by four pieces of tape attached to the four corners of the shield and tied two around the waist and two beneath the groins. The soft catheter is firmly moulded or soldered to the shield. In its outer end a small cork is inserted. As the urine collects sufficiently to demand evacuation, the bladder forces out a portion, and as soon as it ceases to exert power enough, the cork is removed from the catheter and the residue is then siphoned out. Patients wearing this tube enjoy great relief over their former condition, and can attend to work or social duties in comparative comfort.

In the present condition of my knowledge on this subject, I am deeply impressed with the safety and value of the *high operation*. For the thorough digital exploration of the bladder it is superior to *perineal cystotomy*.

The same is true beyond all question in the removal of tumors.

For drainage of the bladder, whether temporary or permanent, it answers every purpose.

For removal of stone or foreign body, to my mind it is so easy, safe and satisfactory that I prefer it to the low operation. In the light of my personal experience, I do not see why suprapubic cystotomy should not supersede all other methods of cutting into the bladder.

REPORT OF A CASE OF EXTRA-UTERINE PREGNANCY. RUPTURE INTO THE PERITONEAL CAVITY AT ABOUT THE FIFTH WEEK; OPERATION THREE WEEKS AFTERWARD. RECOVERY.

Read by Title in the Section of Obstetrics and Diseases of Women, at the Forty second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY RUFUS B. HALL, M.D.,

OF CINCINNATI, O.

SURGEON TO THE CINCINNATI FREE HOSPITAL FOR WOMEN; CLINICAL LECTURER ON GYNECOLOGY AT THE MIAMI MEDICAL COLLEGE ETC.

Mrs. M., aged 30, of Winton Place, married nine years, mother of three children, the youngest 5 years old. Three years ago had an abortion and some septic trouble following, since when she has had some pelvic trouble, and been under the care of several physicians. For the past year her health was somewhat improved, yet she was not well. December 29 the menstrual flow commenced, which was the twenty-eighth day. The flow stopped January 3, and was normal in every respect. February 1 she commenced to menstruate, and the flow continued seven days, but it was different from former periods, inasmuch as the flow continued an hour or two or half a day, and then stopped several hours, and during the whole period she suffered more pain than ever before during menstruation. From the 7th to the 12th she was quite free from pain, but on the 12th she had cramping pain in the lower part of the abdomen, coming on after a walk of some distance. This pain was quite severe, and grew gradually worse until the 15th, when the family physician, Dr. R. H. Whallon, was called on account of the pain in the abdomen, which was now very severe. The doctor visited her daily for four days, at which time she appeared to be convalescent, and said she was free from severe pain. She remained quite comfortable, requiring no medicine to relieve pain, and on the 22d she took a drive with some friends. On the 23d,

when in conversation with her mother, she suddenly grew very pale—this was so marked that it alarmed her friends, and they requested her to lie down. Although she had no severe pain at that time, yet the whole abdomen was sore and tender. The night of the 24th the patient got out of bed to use the commode, and fainted twice before her husband could get her on the bed again. She was never able to get up after that date until after the operation was made. After the 24th of February she had more or less pain all the time, with a sense of discomfort in the abdomen. March 1st to 7th she had a simulating menstruation discharge, and discharged shreds of decidua. March 8 there was first observed an enlargement in the left side of the abdomen, as large as the closed hand, which gradually increased in size. March 11 Dr. William H. Taylor was called in consultation, and diagnosed extra-uterine pregnancy, with rupture into the left broad ligament. On the 13th, Dr. E. W. Walker saw the case with Dr. Whallon, in Dr. Taylor's place, as the latter gentleman was unable to attend. On the 15th I saw the case with Drs. Whallon, Taylor and Walker. At that time there was an enlargement in the pelvis and left side of the abdomen as large as an adult head, which could be plainly outlined, extending diagonally across the abdomen from about two inches below border of the false ribs on left side, to midway between the anterior superior spine of the ilium and the pubic spine on the right. The uterus was in front of the mass, and pushed to the right side of the pelvis. The diagnosis of extra-uterine pregnancy with rupture into the folds of the broad ligament, which had been made four days previously, was believed by all present to be correct. But as the mass was increasing in size, and the patient losing strength, it was believed that an intra-peritoneal rupture would probably soon occur; therefore an immediate operation was advised. After a few hours to consider it, the family decided to have it made, and it was performed on the morning of the 16th. Present and assisting, Drs. Whallon, Taylor, Walker and Colter. When the cavity was opened, we came upon a mass in the abdomen which proved to be blood clot, as thick as jelly, and almost as black as tar. I felt first for the uterus, making certain that my hand went down upon the right side of that organ; by so doing I felt that I could better outline the parts, and as soon as the hand could be made to glide over the fundus I could at once grasp the tube near the uterus, on the side of rupture, and thus control hæmorrhage. By this method, I did not lose any time in definitely locating the parts. I first attempted to bring the tube into the incision, but the decidua became detached, and with some blood clot was removed. I at once secured the tube which formed the sac and tied it off. I now turned my attention to cleansing the abdominal cavity from blood clot, of which

there was an incredible amount, estimated to be about $4\frac{1}{2}$ pints. After thoroughly irrigating the cavity and placing a drainage-tube, the cavity was closed. The patient recovered without incident, and was able to sit up on the twentieth day after the operation. It is very difficult to say whether the rupture occurred on the 15th or the 24th of February, but it is a matter of scientific and practical interest to settle as near as possible; this, however, can only be approximate in this case. We are certain that it occurred as early as the 24th, if not on the 15th, and I am very strongly inclined to the opinion that it occurred at the time of her first severe pain, on the 15th.

It was probably the loss of blood that caused her to faint on the 24th. This belief is strengthened by the fact that on March 8 the abdominal enlargement was first observed, which would quite agree with the theory that the bleeding went slowly on during the interval, and the fluid portion being absorbed, leaving the blood clot, forming the enlargement. I recorded the case because these cases are always interesting, and to emphasize and illustrate a few facts in connection with this case which are of vast practical importance to the general practitioner and specialist alike. In this case there was not a single symptom or sign to lead one to believe that there was an intra-peritoneal rupture, yet the rupture was free under the peritoneal cavity, and not into the broad ligament, as we all believed before the operation. The pelvic floor was displaced downward, and the tumor was rounded and felt firm and fixed, as we would expect to find in a case of rupture into the broad ligament. This deceptive condition can now be explained in the following manner: The rupture occurred early at the end of the fourth or fifth week of gestation, near the middle of the tube, on its free border. This, at first, was probably quite small, and bled slowly, the more fluid portion of the blood being absorbed, leaving the blood clot, which the omentum and intestine became adherent to, closing off the greater portion of the abdominal cavity from contamination. As the bleeding continued, the intestine and omentum were crowded away from the left iliac fossa, but at the same time keeping the blood clot confined in that locality, thus making the apparent tumor. Adhesions of several weeks' duration were quite firm, and thus we can account for the depression of the pelvic floor simulating a rupture into the broad ligaments.

If we had waited for the absorption of that amount of blood clot, with the bleeding still going on, we would have lost our patient. The case demonstrates the difficulty attending a correct diagnosis as to intra- and extra-peritoneal rupture in extra-uterine pregnancy, as well as the danger of attempting the same—thus encouraging delay. We had in this case the very signs which are believed to be characteristic of rupture

into the folds of the broad ligament, when it was really a rupture free into the peritoneal cavity, as the specimens plainly show. With these facts before us, after we have made our diagnosis of extra-uterine pregnancy, are we to stand idly by and wait until we are certain the sac has ruptured into the peritoneal cavity, in any given case, before we recommend an operation? This is a very important question, and one that is by no means settled in the professional mind, but the careful study and report of these cases will soon settle this difficult problem. I now believe, if the case comes under observation before the fourth month, it is our duty to give the patient the best chance for her life; and that is an abdominal section, and that without delay. I here present the specimens in these three bottles. In the first one you will see the left tube, dilated into a sac the size of a small orange, with a rupture in the free border. In the second bottle you will find the decidua and blood clot. This clot, with the decidua and fœtus, were in the tube at the time of the operation, and came away in my hand when I first attempted to bring the tube into the incision. The fœtus, which is in the third bottle, was afterward found in the blood clot by Dr. Taylor, and as you see, is less than one inch in length.

RUPTURED UTERUS. OPERATION AND AMPUTATION OF A SECTION OF INTESTINE. A UNIQUE CASE.

BY H. WARDNER, M.D.,
OF CHICAGO, ILL.

Trusting the following report may be of interest, I send it to *THE JOURNAL*, in the hope that if there is a similar case on record, or having occurred in the practice of any physician, it may come to light. So far, I have not been able to find one in medical literature, or in the experience of physicians with whom I have conversed on the subject.

On Sunday, August 11, 1889, I was requested by my friend Dr. Dodds, of Anna, Ill., to visit with him a patient in a neighboring village, a young married woman, who seemed to be suffering from a delayed miscarriage, about which there was something unusual.

From the doctor, the patient and her husband, who was also a physician, I obtained in substance the following history of the case: On Wednesday evening, the 7th, she was at Anna, where, in running to catch the train just starting from the depot, she jumped and partly fell in getting aboard the car. She "felt something give away," and an uneasy feeling followed, coupled with more or less pain. After reaching her home, she spent the time up to nine o'clock playing croquet, although the bad feelings con-

tinued. At or a little after midnight she was taken with regular labor pains. She had all the symptoms of a miscarriage—the uterine contractions, the show of blood, and the presentation of a membranous sac at the mouth of the womb. (She had had a miscarriage some months previously at about the sixth month of gestation.)

The symptoms continued, with a great deal of suffering, until the Friday following, when Doctor Dodds was called to the case.

He found, on examination, a stringy substance resembling a cord, with membranes, and a tumor at the *os uteri* similar to that of a breech presentation or a *caput succedaneum*. He saw the case again on Saturday, the 10th, and finding her no better, but worse, and becoming exhausted, sought further advice.

I saw her, with Dr. D., Sunday afternoon. We found her lying upon her left side, limbs drawn up, face pinched and drawn in lines, indicating great internal suffering. She was pale and sallow; pulse 90, quick and thready. There was no swelling or enlargement of the abdomen, but the abdominal walls were rigid, as though the muscles were in a state of tonic contraction. She had been vomiting a greenish fluid for two or three days. The stomach was very irritable, retaining but little food or fluid of any kind.

A digital examination revealed a membranous, stringy mass, attached to a tumor lying partly within the uterus, with the larger part protruding into the vagina. The sensation communicated by the touch was similar to that of an encysted foetus of about two and a half months. She could not bear traction on this mass, saying "it hurt her stomach, and gave her severe pain in the head, which subsided as soon as traction ceased."

Upon examination with a speculum, and removal of the decomposing, bloody fluid present, that gave out a strong odor of the lying-in room, the stringy mass of tissue was seen to be in a sloughing condition, and very offensive. She was very sensitive to the manipulation. An anæsthetic was administered, when the mass was drawn down carefully and brought into view externally, when, to our great surprise, we discovered the form of small intestine. At this moment there was a discharge of a few drops of fecal matter. The opening into the gut was found in both upper and lower fragments, a strangulated loop having sloughed away. The stringy mass was mesenteric, and the tumor was the congested portion of the upper fragment of the intestine lying in the vagina between the *os uteri* and the slough. It was evident a loop of the small intestine had come down through the fundus of the uterus into its cavity, and that the organ had contracted, as in labor, to expel the intruding mass, producing strangulation and sloughing as a consequence.

The prognosis was unfavorable, and an early fatal result expected.

The dead parts of the gut were excised, and the patient put upon anodynes, and all the bland nourishment the stomach would bear.

After two or three days of depression, and more of the intestine having sloughed away, there was an effort of the system toward a rally of the vital forces. She had one passage from the rectum, clearing the lower fragment of the tube, and the feces from above passed per vaginam.

This condition gave rise to the faint hope that she might endure an operation for relief. Dr. John E. Owens, of Chicago, was called by telegraph, and came on the morning of the 20th. With him there were present at the consultation Drs. Ferrell, Vick, Dodds, Stocking, the husband of the patient and the writer.

The operation was decided upon, it being the only hope for relief, but with only a shadow of a chance for success.

The patient was placed on the table at 11:40 A.M., etherized, and Dr. Owen proceeded with the operation, assisted by the others present. The usual incision was made between the umbilicus and pubis. An abscess was found in the connective tissue between the bladder and the pubis. She had complained of vesical irritation and pain for three or four days. The ends of both fragments were found to be incarcerated in the uterus, and had become adherent to the walls of the opening through its fundus, so that it took considerable force to detach and remove them. On account of the doughy and lifeless condition, it was necessary to cut away three or four inches from each fragment. This involved, on the upper side, the removal of the ileo-cæcal valve and the lower end of the ascending colon. The ends were then stitched together by a combination of the Czerney and Lembert methods, the abdomen cleared and washed out with antiseptic solutions, and the wound closed; a drainage tube inserted through the uterus, and another left in the lower end of the abdominal wound.

The complications of the case made the operation necessarily tedious. About fifteen inches of intestine was lost by sloughing and excision.

The patient was placed in bed at 2:45 P.M., and died at 4 o'clock, one and a quarter hours later. There was no autopsy.

The severe pain in the head whenever traction was made on the protruding intestine is worthy of note as a means of diagnosis, should any one be so unfortunate as to meet with a similar case. All the other symptoms were those of a premature labor or a strangulated hernia.

What caused the opening through the uterine fundus? Possibly the wall was ruptured during the labor that occurred several months before. Possibly it was the result of an abscess. But I

have no satisfactory hypothesis to explain its existence.

If any physician knows of a case in medical literature or in practice similar to the above, he will confer a favor by informing me of it.

4106 Drexel Boulevard, Chicago, Ill.

TRANSLATION.

THE DIFFUSION OF THE POISON OF TETANUS IN THE ORGANISM.

At the meeting of the Société de Biologie of Paris, June 27, 1891, M. Camara Pestana presented the following note :

The symptomatology of tetanus is the consequence of the absorption of a toxine produced by the bacillus of Nicolaier, the latter remaining localized at the point of inoculation, as has been demonstrated by MM. Kitasato, D. Sanchez-Toledo, Veillon, and others. I have undertaken the study of the diffusion of the tetanic poison in the body, from the scientific standpoint, with the following results: The toxine which I employed was obtained from a pure culture of tetanus given me by M. Sanchez-Toledo, and which cultivated in bouillon, in the absence of air, was maintained at a temperature of 38° (100.4° F.) for nineteen days, and was then filtered through a porcelain filter. Control cultures made with the filtrate from the bouillon, and in gelatine, showed that the filter did not allow the passage of any bacilli; moreover, microscopic examination at the points where the injections of the filtered liquid were made, always showed the absence of the tetanus bacillus.

The experiments were made on guinea pigs and mice; the guinea pigs were used for the direct injection of the toxine obtained from the cultures; the mice were employed to determine the toxicity of the different organs of the guinea pigs injected with the toxine.

In the preliminary experiments I sought first to ascertain the effects of the liquid which I employed. One drop of toxine injected under the skin of the thigh of a guinea pig caused tetanus at the end of twelve hours, and death in twenty-four hours. One-twentieth of a drop produced in mice all the symptoms of the disease in eighteen hours, and death in thirty-eight hours.

The experiments were divided into these series, with the object of determining the toxicity of the different organs of the guinea pig :

1. At the moment of the appearance of the first symptoms of tetanus ;
2. After the generalization of these symptoms ;
3. After the death of the guinea pig.

In the first series of experiments I injected seven drops of toxine under the skin in the sacral region of the guinea pig. As soon as the first symptoms of tetanus were produced (contractions of the posterior members), I killed the animal by section of the carotid. The blood obtained was injected in different quantities under the skin of the mice. The following organs: kidneys,

liver, spleen, lungs, spinal cord, muscles of the region where the injection had been made, and muscles of the thigh, were removed with suitable precautions as to cleanliness, and in nearly equal weights. Each of these organs was finely triturated with a given quantity of physiological solution of sodium chloride. Then the effects of the emulsions of each of these organs on mice, were studied.

The symptoms of tetanus and death were produced uniformly in the mice who had received under the skin fifteen or more drops of blood, and also in those who had been inoculated with the emulsion of the muscles from the region of injection. The other mice presented no symptoms of tetanus.

In the second series, I killed the guinea pig after the development of all the symptoms of tetanus, that is to say at the time when the convulsions had become generalized. One cubic centimeter of blood, and one-half cubic centimeter of the emulsion of a small portion of the liver, produced tetanus, leading to the death of the mice at the end of 48 hours, with all the symptoms of the disease.

The emulsions prepared from the other organs and tissues produced no effect, except that from the muscles of the region injected, which always gave positive results.

Finally, in the third series of experiments, where I awaited the death of the guinea pigs before injecting the mice with emulsions of the organs, of the blood, and of clots found in the heart, I found that the liver only produced tetanus.

The phenomena are somewhat modified if the guinea pigs be injected with larger quantities of the filtrate from the cultures, 1.5 c.c. for example.

In the first series, the results were the same; but in the second and third series, tetanus was produced not only by the liver, and by the muscles of the injected part, but also by the spleen, the lung and the kidney. While the mice injected with the liver emulsion presented symptoms of tetanus in twenty-four hours, and died at the end of thirty-six hours, those injected with other organs, presented the characteristic contractions only at the end of forty-eight hours.

Injections made with urine and the spinal cord, always gave negative results.

The following conclusions I believe to be justifiably drawn from the foregoing facts :

1. The absorption of the toxine of tetanus is made by the blood.
2. The lungs, spleen, kidney, but principally the liver, withdraw from the blood the poisonous principle, and retain it.
3. The toxine is not eliminated to any appreciable extent by the urine.
4. Notwithstanding the striking predominance of neuro-muscular phenomena in tetanus, the presence of the toxine in nervous and muscular tissue cannot be shown; all the experiments made with these tissues gave negative results.—*La Semaine Médicale*.

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BY-LAW IV.—THE PUBLICATION OF PAPERS AND
REPORTS.

No report or other paper shall be entitled to publication in the volume for the year in which it shall be presented to the Association, unless it be placed in the hands of the Board of Trustees on or before the first day of July. It must also be so prepared as to require no material alteration or addition at the hands of its author.

Authors of papers are required to return their proofs within two weeks after their reception; otherwise they will be passed over and omitted from the volume.

Every paper received by this Association and ordered to be published, and all plates or other means of illustration, shall be considered the exclusive property of the Association, and shall be published and sold for the exclusive benefit of the Association.

The Board of Trustees shall have full discretionary power to omit from the published *Transactions*, in part or in whole, any paper that may be referred to it by the Association, or either of the Sections, unless specially instructed to the contrary by vote of the Association.

LONDON OFFICE, 57 AND 59 LUDGATE HILL.

SATURDAY, AUGUST 1, 1891.

THE SPECIFIC GRAVITY OF HUMAN BLOOD.

Since the discovery of the blood corpuscle and the invention of the compound microscope, the attention of hæmatologists has been almost wholly directed to a study of the formed elements of the blood, while its general physical properties and plastic elements have been largely neglected. Especially has this been true of the pathological relations of the blood; a brief reference to our standard works on pathology will show how infrequent are references to changes in the physical properties of the blood, and what is then said upon the subject is mostly confined to the varying phenomena displayed by coagulation. In part this defect has been due to technical difficulties and to the small quantity of blood available for clinical examination.

In 1884, ROY (*Journal of Physiology*) studied the specific gravity of the blood after a method devised by myself, and applicable to small quantities of blood. The process was extremely simple, consisting in the preparation of solutions of a neutral salt of varying specific gravity. A small mass of coagulated blood was then thrown successively into each jar until a point was reached when the blood would neither float nor

sink. It is apparent that this method was tiresome and inaccurate, especially was the latter true in cases where the normal coagulating power of the blood was impaired.

SCHMALTZ (*Deutsches Archiv. für Klin. Med.*) has described an instrument that is much more convenient, and with which exact results are attained with a small quantity of blood. It consists essentially of a small glass tube 12 c.m. long, ending in a capillary projection at both ends. This is carefully weighed on a delicate balance, it is then filled with distilled water and weighed, and lastly with the blood to be examined. From the differences in these figures the specific gravity may be readily calculated.

Recently DR. ERICH PEIPER (*Centralblatt für Klin. Med.*, March, 1891), has contributed an exceedingly interesting series of studies of the specific gravity of blood, after the method of SCHMALTZ. The blood of forty-nine healthy persons was examined, of these twenty-five were adult men, thirteen were adult women, eight were boys and three girls. In adults the specific gravity presented a range of from 1045 to 1066, the average for men being 1055, and for women, 1053. The average for the children being 1052 and 1050 respectively.

The examination of the blood in 10 cases of anæmia and chlorosis showed a distinct decrease in the specific gravity, the variation being from 1030 to 1051, and the average 1042.

In most cases attended by asthenia and the development of cachexia such as phthisis, carcinoma, chronic gastritis and leukæmia, a marked diminution in the specific gravity was found. In six cases of advanced phthisis an average of 1042 was noted, while in five cases of beginning phthisis, the figures were normal, 1055.

Of marked interest is the enormous lessening of the specific gravity in cases of nephritis. A boy ten years of age with parenchymatous nephritis, showed only 1023, after four weeks and marked improvement in the disease, the figures rose to 1054. In two other cases of acute nephritis, a specific gravity of 1030 and 1033 was found. In cases of recent acute nephritis, the figures were not materially lessened.

In cases of heart and lung troubles that were accompanied by cyanosis, bronchitis, fatty heart, emphysema and valvular lesions, a marked increase in the specific gravity of the blood was

noted; the same was found to be true in febrile conditions, while in sub-acute and chronic rheumatism and diabetes but little change was observed.

We feel that the interest and importance of these observations merit special mention, and we hope that further studies will be made of this subject. It is perhaps too much to hope that these methods will be widely used in practice, as but very few physicians will have the time and patience to struggle with the technical difficulties; we can, however, look to our hospitals, with their well equipped laboratories, for a marked advance in our knowledge of the plastic elements of the blood, and a corresponding advance in our grasp of diseased processes.

MALPRACTICE.—DR. PARKER VINDICATED.

The Appellate Court of Illinois has just affirmed the decision of the Cook County Circuit Court in favor of the defendant in the case of EDW. C. SIMS *vs.* ANDREW H. PARKER. The plaintiff Sims, who is a mechanical engineer, doing heavy work, had been wearing, upon a physician's advice, a truss on the left side as a preventive for hernia. This was prescribed because of a pain which he felt in the left inguinal region in 1881. In March, 1888, he applied to DR. PARKER, who is a dealer in trusses, for relief from a similar pain on the right side. On examination DR. PARKER found an inguinal swelling which he pronounced a hernia, and fitted Sims with a double truss. From the beginning SIMS complained of the pain of the truss, but continued to wear it for about a month, when he became feverish and went to bed. He was confined to his bed about three weeks, at the end of which time the inguinal swelling had become as large as an egg, and in three weeks more had developed into an abscess seven inches long, the contents of which were evacuated by his attending physician, Dr. Snyder. Subsequently another abscess formed.

The contention of the plaintiff was that the truss had been improperly applied, and had produced the abscess. DR. SNYDER, who attended SIMS, testified that there was no pus, and no abscess prior to May 23, that is, two months after the truss was first applied. When pressed to give as his opinion that the truss had caused the abscess, he was of course unable to do so. DR.

HENRY HOOPER, who saw the patient in consultation with DR. SNYDER, May 23, testified that he found a large internal ring, but no hernia, and was unable to say whether a hernia had ever existed. In his defense DR. PARKER introduced many of the most prominent physicians and surgeons of Chicago, who testified to his great skill and ability as an adjuster of trusses, and to the impossibility of a truss producing an abscess. The gentlemen who testified in DR. PARKER'S behalf were DRS. A. J. BAXTER, MILTON JAY, RANSOM DEXTER, F. A. HUDSON, R. W. ISHAM, GEO. T. SPEARS, E. S. CROSS, N. S. DAVIS, J. R. MCCOLLOUGH, and ALLEN W. GRAY.

DR. PARKER testified that he had been engaged in the business of making, adjusting and selling trusses, since 1861.

The trial court took the case from the jury and decided in favor of the defendant on the ground that there had been no evidence introduced to show that the defendant was negligent or unskillful in his diagnosis or treatment. This action the Appellate Court approved.

The decision of the Appellate Court is of so much interest to the profession generally, that we publish it in full elsewhere in this issue of *THE JOURNAL*.

The decision indicates that a long established reputation, and the favorable consideration of the profession are not to be lightly overthrown.

The great importance of the decision to the profession we take it, is its emphasis of the doctrine that a mistake in diagnosis or an error in treatment is not sufficient to uphold a suit for malpractice. We are all human and must and do make mistakes in diagnosis, and in treatment. The complicated and incomplete data upon which physicians must base their judgments, make mistakes inevitable. No one but the charlatan is always right. But for negligence, and lack of average skill we may justly be held responsible, for these are errors which it is within the power of every qualified practitioner to avoid.

The profession, as well as DR. PARKER, is to be congratulated on the outcome of this case. But congratulations will not remunerate DR. PARKER for the unjust expenses to which he has been put, or for the worry and anxiety which he has had to undergo, nor for the actual although unjust, damage to his reputation, which every

professional man must suffer who is subjected to a malpractice suit. It is this last feature which makes it just to compel the plaintiff in a proposed malpractice suit, as is done in some States, to furnish bond to make good any damage which he may do the defendant in case his suit miscarries. In a case of real malpractice such provision would work no harm to the plaintiff, but it would prevent the filing of suits for blackmail or revenge, as is now so frequently done. It seems a little unjust to the medical mind that a physician must give bond before he attaches the property of a debtor, but that that debtor may turn around and attach the physician's reputation by a malpractice suit, in the most summary manner imaginable.

THE POISON OF TETANUS.

Last week we reviewed the etiology of tetanus, calling attention to the principal features of the bacteriology and chemistry of this disease, and particularly to the recent work which SANCHEZ-TOLEDO reported to the Société de Biologie. At the next meeting of this Society, June 27, 1891, CAMARA PESTANA reported the results of his very ingenious experiments relating to the chemistry of tetanus. A translation of his paper, as it appears in the report of the Society's proceedings in *La Semaine Médicale* of July 1, 1891, we present to our readers this week (see page 192), bringing the work on the etiology of tetanus up to date. Tetanus is particularly interesting, because the chain of events between the bacillus and the disease is here more fully revealed than in the case of any other disease. We do not mean to assert that the bacillus of NICOLAÏER has been shown to be the cause, and the only cause of tetanus, any more certainly than any other germ is shown to be the cause of a certain disease, for such is not the case. The right of KOCH's bacillus to the name bacillus tuberculosis, is established much more satisfactorily than the right of NICOLAÏER's bacillus to be called the tetanus bacillus. But the means by which the bacillus tuberculosis works is not known. Its chemistry yet remains to be revealed. Some of the chemical products of microorganisms which will produce diarrhœa, are known, but the bacteriology of the summer diarrhœas of infancy, is still in a very tangled state. In the sense here indicated, it may be asserted that the scientific

completeness of the etiology of tetanus is exceptional.

PESTANA's paper, however, is of wider interest than the particular subject of which it treats. His experiments point out a convenient means of recognizing the distribution of the poison in a poisoned animal, when satisfactory chemical tests for the particular poison are unknown or not available. His experiments emphasize the importance of that function of the liver which consists in the withdrawal from the blood of poisons, and their destruction. His work also indicates that there is but little tendency on the part of the tetanic poison to escape by way of the kidneys. We hope that his work may be carried further to determine, if possible, the particular eliminative channel through which the tetanic poison most readily finds exit, or how its toxic effects are most certainly reduced within the body. We recently intimated in these pages that it would be of clinical importance to determine through what avenues given poisons might best be eliminated from the body. PESTANA's work gives a method by which such data may be experimentally determined.

PURE CULTURES.

By a pure culture is generally understood one which contains but one form of life, a single definite microorganism. This use of the term "pure culture" is justifiable so long as the use which is made of the culture is only morphological. Pure cultures of this type answer all requirements for the classification of microorganisms, for their morphological study. They might with propriety be termed "morphologically pure cultures." The absence of the limiting word, however, has lead to an improper idea of the purity of these cultures, and to a use of them for chemical purposes that is not strictly justifiable. Since the time when BRIEGER sewed such morphologically pure cultures in various media, and extracted therefrom the ptomaines formed, it has become customary to form similar cultures with pathogenic germs and to extract from them the poisons formed, so far, ptomaines or alkaloids, and toxalbumins, and to attribute the poisons so obtained to the biological activity of the germs. In the main, no doubt this conclusion is correct. But it is not necessarily correct.

The experiments of VAILLARD and VINCENT

with the tetanus bacillus referred to last week led them to believe that this bacillus formed an enzyme or unorganized ferment. Whether this be true or not, there can be but little doubt but that some microorganisms do produce such enzymes or soluble ferments. We do not wish to draw any hairsplitting distinctions between a germ and its enzyme, being willing to recognize that the chemical products of the enzyme are the chemical products of the biological activity of the germ. But herein lies the difficulty. The mechanical methods in vogue of separating germs from each other, and securing morphologically pure cultures of individual microorganisms, afford no guarantee that there has not been carried along with one germ, some of the enzyme of another to contaminate the resulting culture. A culture then may be pure, morphologically, but at the same time be contaminated with the enzyme of another germ. It is not a chemically pure culture.

It is true that an enzyme can not multiply while the organized ferment, the germ, can, so that in succeeding cultures, absolute purity may be obtained. But the infinitesimal amount of an enzyme which is necessary to produce a fermentation, and the uncertainty which attends the determination of its presence or absence in cultures prepared in the ordinary way, must necessarily throw a cloud over chemical deductions made from such cultures.

At least two ways are open to prepare cultures free from the enzymes of other germs.

If a culture be placed in a porcelain filter it may be washed with as much water under pressure as may be necessary to thoroughly cleanse it. The water will dissolve all enzymes and carry them through the filter, while the bacilli themselves remain.

So far as known all enzymes are chemically related to the proteids, at least they are rendered inert by a temperature a little short of the boiling point of water. Adult bacilli are likewise destroyed by a like temperature, but spores are not. So that with all sporulating microorganisms, heat could be used to destroy the enzymes and adult bacilli, and leave the spores to develop into cultures which would be pure in reality.

It is therefore urged that all cultures whose chemical products are to be investigated, should first be rendered pure, chemically as well as morphologically.

THE MISSISSIPPI VALLEY MEDICAL ASSOCIATION.

In no other direction is the activity of thought and observation among medical men so perceptible as in the growth of interest in their societies. Last week it was our sincere pleasure to direct attention to the meeting next month in Washington of the Congress of American Physicians and Surgeons. Only a month later, in October, will be convened in St. Louis the Mississippi Valley Medical Association. The former is a gathering of specialists, the latter is distinctively a society of general practitioners.

Politicians and political economists often refer to our agricultural brethren as constituting the bone and sinew of our country, so we may without offense speak of the general practitioners of medicine as constituting the backbone, ribs and bosom of our art. They are the all-round men, who are called upon at all hours and seasons, to skilfully treat an inflamed corn, a flooding uterus, a fractured skull, or any of the other ills that afflict humanity—and rarely indeed is the record made, that they were not equal to the occasion.

These are the men who will gather at the Pickwick Theatre in St. Louis, on the morning of October 14, and continue in session until the close of the afternoon of the 16th. Nor will the general practitioners be allowed to become lonesome or to absorb all the good things of the occasion, for there is not a specialist within a thousand miles of St. Louis who is not perfectly familiar with the multitudinous advantages that just roll in upon him, through an attendance at the annual meetings of the Mississippi Valley Medical Association, and—he'll be there.

This year the President of the Mississippi Valley Medical Association is Dr. C. H. Hughes. The hundreds of physicians in the Valley who know Dr. Hughes will every one of them go to this meeting, that is a foregone conclusion, and the other hundreds who don't know him should be advised, and advised strongly, to go and make his acquaintance. Dr. I. N. Love is chairman of the Committee of Arrangements. This announcement means that every detail for the accommodation and entertainment of the members will be amply—fully provided for. There will be no slips or unforeseen contingencies. While the entire profession of St. Louis regard the Mis-

Mississippi Valley Medical Association as very much their own organization.

The working methods of the Mississippi Valley Medical Association are of such a character as to commend it to every man who practices the healing art; and every physician who practices rational medicine and is in good standing with his professional neighbors, is eligible and welcome to its membership. The only fees are one dollar per year. The man who goes once, is forever after a confirmed *habitué*, besides that, he becomes a regular missionary in his zeal in endeavoring to get others to go to the next meeting.

Furthermore, an attendance on a meeting of the Mississippi Valley Medical Association is just about as good an outing as a practitioner of medicine can take at that particular time of the year.

Decision of the Appellate Court in the Case of Edward C. Sims vs. Andrew H. Parker, M.D.

Edward C. Sims, Appellant, vs. Andrew H. Parker, Appellee. Appeal from the Circuit Court of Cook County. Moran, P. J.

This action was brought to recover damages for an injury alleged by appellant to have been caused to him by a truss improperly applied and adjusted to him by appellee for the cure of hernia, when in fact, he had no hernia.

At the close of the evidence at the trial, the Court directed the jury to find a verdict for the defendant.

Plaintiff had for some years worn a truss on one side, and in March, 1888, feeling certain pains, he went to defendant's place of business, and told his symptoms, and afterwards was examined by defendant, who told him that he was ruptured. Thereupon plaintiff purchased a truss from defendant, and had him adjust it to his person.

After the truss was put on plaintiff suffered great pain, and went back to defendant several times, complaining of the pressure of the truss, and plaintiff readjusted the truss and told him it was necessary to have pressure in order to effect a cure of the alleged hernia. After wearing the truss about two weeks, plaintiff became sick, and an abscess appeared at the point where the bulb of the truss had pressed.

The evidence shows that the plaintiff suffered great pain from the abscess, and was sick for a long time, and his contention is, that the abscess was the result of the too great pressure of the truss produced by the improper adjustment thereof to his body. It is shown that plaintiff was very fleshy; that at the point where he located the pain which he complained of, when he first went to defendant, there was a slight swelling or protuberance, and that over this defendant adjusted the bulb of the truss. When the truss was taken off at the end of two weeks this swelling had increased, and as before said,

developed into an abscess. The physician who attended plaintiff and who was a witness on trial, was unable to say whether there was an incipient abscess at the time the truss was first adjusted, or whether the abscess was produced by the pressure of the truss.

The fair result of the evidence of the experts sworn is, that there was in fact no rupture on the person of plaintiff, but it is also proven that it is very difficult to tell, with certainty, in many instances, whether in fact there is hernia or not, particularly in the case of fleshy persons.

Defendant introduced a number of leading surgeons and physicians of the city, who testified to the reputation and skill of defendant in treating hernia, and in fitting and adjusting trusses.

While there is evidence tending slightly to support the contention that the abscess may have been produced by the pressure of the truss, there is absolutely no evidence that defendant was negligent or unskilful in his diagnosis or in fitting the truss.

Proof that he was mistaken as to the existence of a rupture, or that the abscess was caused by the pressure of the truss, was not enough to entitle plaintiff to a verdict.

Proof of a bad result or of a mishap is of itself no evidence of negligence or lack of skill. The defendant is qualified to practice medicine and surgery, and the evidence of the experts in his profession shows him competent and skilful. Before a recovery could be had against him, it must be shown that his treatment was improper or negligent, not merely that he was mistaken, or that his treatment resulted injuriously to plaintiff. A physician or surgeon, or one who holds himself out as such, is only bound to exercise ordinary skill and care in the treatment of a given case, and in order to hold him liable, it must be shown that he failed to exercise such skill or care.

McNevin vs. Lowe, 40 Ill., 209.

The jury cannot draw the conclusion of unskilfulness from proof of what the result of the treatment was, but that the treatment was improper must be shown by evidence.

"No presumption of the absence of proper skill and attention arises from the mere fact that the patient does not recover, or that a cure was not effected."

Haire vs. Reese, 7 Philadelphia: R., 138.

No man, skilled or unskilled, undertakes that he shall be successful; "he undertakes for good faith and integrity, but not for infallibility, and he is liable to his employer for negligence, bad faith or dishonesty, but not for lapses consequent upon mere errors of judgment."

Cooley on Torts, 777.

Holtzman vs. Hoy, 118 Ill., 534.

Proof of the lack of skill or negligence on the defendant's part—a necessary element in plaintiff's case—being entirely lacking, the Court properly instructed the jury to find for the defendant.

The judgment must be affirmed.—*Affirmed*.

In Testimony Whereof, I have set my hand and affixed the seal of the said Appellate Court, at Chicago, this twenty-fifth day of July, in the year of our Lord one thousand eight hundred and ninety-one.

THOMAS G. McELIGOTT,

Clerk of the Appellate Court of the First District.

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

A Chinaman, named Hop Sing, presenting a well marked case of leprosy of the tubercular variety, who has for some time past been running a laundry on the east side of the city, was recently discovered by the Board of Health, and when the announcement was made of the nature of his disease there was considerable consternation in the neighborhood. It seems that the man came to New York about a year and a half ago, and it is probable that he was then already affected. When his fellow countrymen living in the Chinese colony in Mott street, found that he was suffering from leprosy, they raised \$200 to send him back to China, but he simply removed to Newark, New Jersey, and with the money opened a laundry there in connection with another leprous Chinaman. Eight months ago, however, he returned to New York and established himself in the location mentioned.

As soon as the existence of the case became known the Health Department made an investigation, and Dr. Dillingham, of the Bureau of Contagious Diseases, pronounced it one of undoubted leprosy. For a few days, however, nothing was done in regard to it, as the danger of infection was not regarded as urgent. On the return of Dr. Cyrus Edson, Chief of the Bureau, who had been absent from the city, the patient was removed to Charity Hospital on Blackwell's Island. In regard to leprosy in this city Dr. Henry G. Piffard, the well-known dermatologist, some time ago made an interesting report from which the following is an extract:

"During the past twenty-five years there have been probably fifty or sixty cases in the city of New York. Of these cases I have personally examined probably twenty five or thirty. With but one exception these cases came from abroad, that is from countries where leprosy is endemic and prevalent. There is at the present time, I believe, a case in the Charity Hospital which has been there for years, but no cases have arisen in this city by contact with any of the afflicted, as far as known to me. In view of the fact that there are rarely more than two or three cases of leprosy in the city at the same time, and the fact that the liability to infection is so slight, it seems to me that it would be hardly worth while for the Health Department at the present time to exercise any supervision over lepers other than to keep a record of their location and surroundings as carefully as possible."

Since 1866, five deaths from leprosy have been reported in New York: one in 1873, one in 1875, one in 1879, one in 1881, and one in 1884.

The fact of Hop Sing's case having been made public naturally directed attention to that of his fellow countryman in New Jersey, with whom he became temporarily associated when he left this city. Dr. Saltanstill, Inspector of the Hudson County Board of Health, after carefully examining the man has pronounced his disease leprosy, and has so reported to the Board.

At the Maternity Hospital on Blackwell's Island, an "incubation" for the preservation of premature and other

infants of low vitality was lately received from Paris, and the first case, a premature child weighing only four and a half pounds, has been very successfully "hatched out" in it. It is announced, however, that at the Woman's Hospital in Philadelphia, two of these incubators have been in use for the last three years, and that during the past year they have been employed in no less than fifty cases, all of which are now living. One of these is said to be quite remarkable, it being that of a six months child. The apparatus, which may not be familiar to all the readers of THE JOURNAL, consists of a ventilated wooden box, containing a perforated mattress, supported by iron rods, on which the infant, wrapped in cotton, is laid, the required heat being furnished by means of hot water bottles placed under the mattress. Daily inunctions with codliver oil are usually employed instead of bathing with water.

By the will of the late Hector C. Havenmeyer, who died in 1880, \$200,000 was bequeathed to various charitable institutions in this city; the selection of these being left to his mother. She has now announced those which she has chosen, and among them are the Manhattan Eye and Ear Hospital, which is to receive \$35,000; the New York Eye and Ear Infirmary, which gets \$10,000, the Presbyterian Hospital, \$5,000, and the New York Post-Graduate Medical School and Hospital, which also gets \$5,000.

New York has just lost two of her most venerable and highly respected physicians. One of them, Dr. John Ledyard Vandervort, who for more than fifty years was the librarian of the famous medical library of the New York Hospital, having been appointed to the position in 1837. At the time of his death, he was in the 83d year of his age, but for about twelve years he had not been in active practice. He was an old time New Yorker, having been born and spent all his life in this city. He was a graduate of Columbia College, and of the College of Physicians and Surgeons.

The other was Dr. Orid P. Wells, who died at the ripe age of 86. He was born in Berkshire County, Massachusetts, but came to New York when quite a young man to practice. In the cholera epidemic of 1832, he did such good work that when the epidemic of 1849 occurred, he was placed in charge of the cholera hospital. Prior to the establishment of the Board of Health he was also City Physician for a time. During almost his entire residence in this city, his home was on West 20th street, and it is said that when he first occupied it there was no brick house except his own north of Washington Square. His funeral services were held at the neighboring church of St. Peter's, where for many years he was a devout worshiper. Dr. Wells was one of the founders of the New York Academy of Medicine, and of late years had been an honored member of the County Association. P. B. P.

Dear Sir:—At bottom of page 21, of THE JOURNAL of July 4, is an item headed "The oldest and largest Medical Society in the United States." The Massachusetts Medical Society, founded in 1781, and now having about 1800 members, might perhaps come nearer to that mark than the Society named in the item.

Respectfully, J. L. WILLIAMS.
Boston, July 7, 1891.

BOOK REVIEWS.

THE FIRE PROTECTION OF HOSPITALS FOR THE INSANE. By L. H. PRINCE, M.D. Chicago: C. H. BLAKELY & Co.

Nothing can be more appalling than a fire in a crowded hospital, filled with the sick or insane. Abundant experience in the past has shown the frequency of these accidents and the inadequate means at hand for dealing with them. We feel sure that the day is not distant when the herding of large numbers of sick and helpless people, in non-fire-proof structures will be considered little less than criminal. Until that time comes every possible precaution should be taken by the organization of a special fire brigade in every institution for the sick and defective classes. This brigade should not only be thoroughly drilled in the most approved methods of fighting fires, but a life saving corps should form part of such fire service.

It is to the solution of this problem that this small work is addressed. A summary of the chapter headings will give an idea of its scope; the prevention of fire, fire extinguishing apparatus, the fire alarm, the fire brigade, drilling of the brigade, the fighting of fire.

While, as the author says, much more is to be learned in such matters from experience and practice than by the mere reading of books, yet the work contains much that will be invaluable in organizing the fire service of any public institution. The writer has developed his ideas by practical experience, having organized the fire service at the Illinois Eastern Hospital for the Insane, one of the best, if not the best in this country. A copy of this work should be in every public institution for the defective classes.

MISCELLANY.

DR. J. P. CROZER GRIFFITH, Professor of Clinical Medicine in the Philadelphia Polyclinic, has also been elected Clinical Professor of the Diseases of Children in the University of Pennsylvania.

HARVARD MEDICAL SCHOOL FELLOWSHIPS.—Three scholarships of \$5,000 each have been established through the gift of William S. Bullard.

DR. NATHAN BOZEMAN.—The University of Alabama, at its recent commencement occasion, conferred the degree of LL.D. on this well-known surgeon.

THE UNIVERSITY OF VERMONT.—Dr. Condict W. Cutler, of New York, has been appointed professor of skin and venereal diseases, to succeed Dr. R. W. Taylor, who has resigned.

DR. W. W. KEEN, of Jefferson Medical College, recently received the honorary degree of LL.D. from Brown University.

AMERICAN DERMATOLOGICAL ASSOCIATION.—The following additional papers will be read at the next annual meeting of this Association, to be held in Washington, commencing September 22:

"The Hypodermic Use of Hydrargyrum Formamidatum in Syphilis," by Dr. R. B. Morison.

"Retarded Hereditary Syphilis," by Dr. R. B. Morison.

"Epilation; its Range of Usefulness as a Dermatotherapeutic Measure," by Dr. J. Zeisler.

ILLINOIS STATE DENTAL SOCIETY.—At the twenty-seventh annual meeting of the Illinois State Dental Society, held at Bloomington, May 12 to 15, 1891, the following officers were elected for the ensuing year: W. H. Taggart, Freeport, President; Garrett Newkirk, Chicago, Vice-President; Louis Ottofy, Chicago, Secretary; W. A. Stevens, Chicago, Treasurer; F. H. McIntosh, Bloomington, Librarian.

The next meeting will be held in Springfield, beginning on the second Tuesday in May, 1892.

LOUIS OTTOFY, Secretary,
70 Dearborn St., Chicago, Ill.

DR. DANIEL G. BRINTON.—Dr. Brinton, so long known for his surgical work, and his former connection with the *Philadelphia Medical and Surgical Reporter*, has received the degree of LL.D. from the Jefferson Medical College, in recognition of his researches in anthropology and ethnology.

ST. LOUIS MEDICAL COLLEGE has been made the Medical Department of Washington University.

PHILADELPHIA'S POLYCLINIC.—The Board of Trustees of the Philadelphia Polyclinic and College for Graduates in Medicine have created a third Chair of Diseases of the Eye, and, upon the unanimous nomination of the Faculty, have elected Prof. George de Schweinitz, M.D., to fill the position.

UNIVERSITY OF MICHIGAN.—Dr. Victor C. Vaughan is made Dean of the Faculty of Medicine in succession to Dr. Ford who has resigned.

MILITARY ORDER OF SURGEONS OF NEW JERSEY.—At the regular meeting of the Military Order of Surgeons of New Jersey, held at Sea Girt, N. J., June 15, the following officers were elected: President—Lieut.-Col. A. K. Baldwin, Surgeon, First Brigade. First Vice President—Lieut.-Col. Franklin Gauntt, Surgeon, Second Brigade. Second Vice-President—Col. George W. Terriberry, Division Surgeon. Secretary—Major E. L. B. Godfrey, Sixth Regiment. Treasurer—Major H. C. H. Herold, Fifth Regiment. The following were elected honorary members of the Order: Surgeon-General Jos. D. Bryan, New York; Surgeon-General Nicholas Senn, Illinois; Major Alfred A. Woodhull, Surgeon U. S. A.; Major John H. Janeway, Surgeon U. S. A.

THE STANDARD DICTIONARY.—From an inspection of advanced sheets, we are led to believe this will be one of the most valuable works ever offered to English-speaking people. It is worthy of the highest commendation.

ASSOCIATION OF AMERICAN PHYSICIANS.—The sixth annual meeting of this Association will be held in connection with the second Congress of American Physicians and Surgeons, at Washington, D. C., September 22, 23, 24 and 25, 1891.

Tuesday, September 22. Session of the Association, 10 A.M.

1. President's Address, William Pepper, of Philadelphia.

2. General Business, Reports, etc.

3. Discussion on the Treatment of Visceral Tuberculosis by Koch's Method. Reports by F. P. Kinnicutt, of New York; Harold C. Ernst, of Boston; William Osler, of Baltimore; Drs. Musser and Griffith, of Philadelphia.

4. The Climate of Southern California for Respiratory Diseases. A Preliminary Paper, Norman Bridge, of Los Angeles.

5. Experimental Studies on the Causes of the Localization of Pulmonary Plithisis and certain other Infectious Diseases in the Lungs, J. W. Roosevelt, of New York.

Session of the Congress, 3 P.M. Conditions Underlying the Infection of Wounds, including a Discussion of Disinfection with reference to the Treatment of Wounds, of the Relation of Bacteria to Suppuration, of the Resistance of Tissues to the Multiplication of Bacteria, and of the Effects of Antiseptic Agents on Wounds.

Referee—Dr. William H. Welch, of Baltimore, Professor of Pathology, in Johns Hopkins University.

Co-Referee—Dr. Roswell Park, of Buffalo, Professor of Surgery in the Buffalo Medical College.

The discussion will be adjourned, if necessary, until Friday afternoon.

Wednesday, September 23. Session of the Association 10 A.M.

6. Discussion on the Remote Results of the Removal of the Ovaries and Tubes.

Referee—William T. Lusk, New York.

Co-Referee—Wharton Sinkler, of Philadelphia.

7. Nerve Stretching in Inveterate Cases of Trigeminal Neuralgia, James Stewart, of Montreal.

8. On the Diseases of the Kidney, popularly called "Bright's Disease," Francis Delafield, of New York.

9. Note on the Recognition of Certain Cases of Epilepsy, accompanied by Albuminuria, which might be mistaken for Cases of Uræmic Convulsions, James Tyson, of Philadelphia.

10. Bradycardia in Acute Articular Rheumatism, I. E. Atkinson, of Baltimore.

Session of the Congress, 3 P.M. The Late Manifestations of Syphilis.

Referee—Dr. Plineas S. Conner, of Cincinnati, Professor of Surgery in the Medical College of Ohio.

Co-Referee—Dr. Abner Post, of Boston, Clinical Instructor in Syphilis in Harvard University.

The President's Address will be delivered in the Lecture Hall of the National Museum at 8 P.M., and will be followed by the Reception of the President from 9:30 to 12 P.M.

Thursday, September 24. Session of the Association, 10 A.M.

11. Discussion on the Relations between Arterial Disease and Visceral Changes.

Referee—George L. Peabody, of New York.

Co-Referee—W. T. Councilman, of Baltimore.

12. Intestinal Perforation in Typhoid Fever, R. H. Fitz, of Boston.

13. The Relation of Drinking-Water to Disease, Henry P. Walcott, of Cambridge.

14. A Contribution to the Pathology of Pernicious Anæmia, J. P. Crozer Griffith and Charles W. Burr, of Philadelphia.

15. On Changes in the Red Blood Corpuscles in the Pernicious Anæmia of Texas Cattle Fever (by invitation), Theobald Smith, of Washington.

Session of the Congress, 3 P.M.

Fibroid Processes (Chronic Interstitial Inflammation Scleroses): their Pathology and Etiology, with Special Reference to the Influence of Diathesis and Heredity.

Referee—Dr. A. L. Loomis, of New York City, Professor of Pathology and the Practice of Medicine in the University of the City of New York.

Co-Referee—Dr. William Osler, of Baltimore, Professor of Medicine in Johns Hopkins University.

Dinner, conjointly with the American Surgical Association, in honor of our Foreign Guests, at the Arlington Hotel, at 8 P.M.

Friday, September 25. Session of the Association, 10 A.M.

16. The Condition and Prospects of the Library of the

Surgeon-General's Office, and its Index Catalogue, John S. Billings, of Washington.

17. Sequel to a Case of Slow Pulse (Purdy), D. W. Prentiss, of Washington.

Report of Autopsy, Robert T. Edes, of Washington.

18. Grave Forms of Purpura Hæmorrhagica, J. H. Musser, of Philadelphia.

19. Pathological Histology of Acute and Chronic Appendicitis, William F. Whitney, of Boston.

20. The Treatment of Typhoid Fever by Systematic Cold Bathing, James C. Wilson, of Philadelphia.

21. Concluding Business.

Session of the Congress, 3 P.M. If necessary, the discussion on the "Conditions Underlying the Infection of Wounds," etc., will be resumed.

General Information.—Drs. James G. Glover and William M. Ord, of London; Drs. McCall Anderson and W. T. Gairdner, of Glasgow; Dr. J. Battey Tuke, of Edinburgh; Professor Curschman, of Leipzig; Professor Kühne, of Heidelberg; and Dr. Löwenberg, of Paris, have already accepted the invitation of the Association to attend the Congress, and will be the guests of the Association, and will participate in the discussions of the papers read before it.

The Association will hold its meeting in Hall No. 1 of the Grand Army Building, 1412 and 1414 Pennsylvania Avenue; and in the Main Hall of the same building the meetings of the Congress will be held.

Members of this Association are *ipso facto* members of the Congress, and as such are expected to register. Parlors 1 and 2 in the Arlington Hotel will be provided for that purpose, from which the mail of the members and guests will be distributed, and at which the city residence of each member or guest can be ascertained. The registration fee is five dollars.

A copy of the transactions of the Congress will be sent to each person who may register; and only those who may register, invited guests, and ladies accompanying them, will be admitted to the Reception of the President.

Dr. Samuel C. Busey is the representative of this Association on the Committee of Arrangements, of which he is Chairman.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from July 18, 1891, to July 24, 1891.

Capt. Reuben L. Robertson, Asst. Surgeon U. S. A., ordered for duty to Ft. Niagara, N. Y., on the abandonment of Ft. Abraham Lincoln, N. Dak.

Asst. Surgeon William L. Kneidler, U. S. A., granted leave of absence for one month.

Surgeon Henry R. Tilton, U. S. A., granted leave of absence for two months on surgeon's certificate of disability.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending July 25, 1891.

Asst. Surgeon James G. Field, ordered to special duty in the Bureau of Medicine and Surgery.

Asst. Surgeon James S. Hope, ordered to the receiving ship "Franklin."

Asst. Surgeon Lewis Morris, ordered to the "Ajax" and other monitors, Richmond, Va.

Asst. Surgeon James F. Keeney, promoted to P. A. Surgeon.

Official List of Changes of Stations and Duties of Medical Officers of the U. S. Marine-Hospital Service, for the Three Weeks Ending July 18, 1891.

Surgeon R. D. Murray, to proceed to Gulf Quarantine for temporary duty. July 1, 1891.

Surgeon H. W. Sawtelle, relieved from duty at Portland, Me., ordered to Boston, Mass. July 11, 1891.

Surgeon Fairfax Irwin, when relieved at Boston, Mass., to proceed to Buffalo, N. Y., for temporary duty. July 11, 1891.

P. A. Surgeon H. R. Carter, ordered to Washington, D. C., for temporary duty. July 2, 1891.

P. A. Surgeon C. T. Peckham, granted leave of absence for seven days. June 30, 1891.

P. A. Surgeon S. C. Devan, when relieved at Buffalo, N. Y., to proceed to Portland, Me., for duty. July 11, 1891.

P. A. Surgeon S. D. Brooks, granted leave of absence for thirty days. July 13, 1891.

P. A. Surgeon J. J. Kinyoun, granted leave of absence for thirty days. July 14, 1891.

Asst. Surgeon E. A. Houghton, to proceed to Cleveland, O., for temporary duty. July 8, 1891.

The Journal of the American Medical Association

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CHICAGO, AUGUST 8, 1891.

No. 6

ORIGINAL ARTICLES.

PLATINUM NEEDLES FOR ELECTROLYSIS.

Read before the Section of Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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It is at present difficult to procure a small sized platinum needle, which is in every respect satisfactory to the operator.

The needles on the market are deficient: for instance, the insulation is rough, uneven, and not smooth on an equal plane from the non-insulated point, to and over the beginning of the insulation, the point is too dull, and will not readily pass through cuticle and fascia; the non-insulated part is weak, and breaks off easily; the shaft, or the whole needle is not stiff enough to be easily pushed into the tissues, and on any attempt at use will bend. The shape of the point is also objectionable, and makes a hole at the point of entrance, instead of cutting evenly and pushing through the tissues more by dilatation, than in such a manner, so that on withdrawal of the needle the point of entrance contracts again, without leaving a bleeding surface.

USE OF NEEDLES.—With the progress and better understanding of electricity in Surgery the use of needles in electrolysis will increase. So far they have been used in the following diseases: Aneurism, varicocele, hydrocele, nævi, portwine marks, angioma, erectile tumors, epilation, xanthoma, ranula, hernia, bronchocele, different tumors, carcinoma, diseases of the prostate, ovarian tumors, fibroids, peri-uterine hæmatocele, salpingitis, hydrosalpinx, and others.

The enumeration of these diseases, in which electrolysis with needles has been used, is made here only as statistical facts, with no intention to elicit a discussion as to whether or not in special cases electrolysis is the best means of treatment. It is a fact, that electrolysis with needles has been used often in a variety of diseases. The probability is, that in the near future, this procedure will be practiced oftener; and therefore

the point at issue is, that it is important to procure good needles, if an operation by electrolysis is intended.

The action of electrolysis is principally a chemical decomposition. If, for instance, chloride of ammonium be decomposed by electrolysis, the chlorine liberated at the positive pole will react upon some of the remaining salt, giving free nitrogen and chloride of nitrogen. If iodide of potassium in solution be subjected to electrolysis, one equivalent of iodine liberated at the positive pole will also have one equivalent of hydrate of potassium liberated at the negative pole, showing that the potassium liberated from combination with the iodide has combined with some of the surrounding water. Potassium and sodium are liberated in a nascent state, combining with the oxygen, thus forming compounds, as caustic soda and potash.

If needles are used for electrolysis this chemical action takes place in the tissues, as well as in the needles; the needles themselves will suffer this chemical decomposition in such degrees as the metal used has the capacity of an electrolyte. If, for instance, zinc needles are used, chloride of zinc will form and remain in the tissues and act as a caustic. All metal needles will oxidize at the positive pole. The knowledge of the decomposition of metals by electrolysis has been used practically by trades and arts and in electro-metallurgy. The electrolytic action is mostly polar, that is the elements liberated will collect at their respective pole, and may extend within a certain radius around the pole. It seems, there is no inter-polar electrolysis; that means while the molecular action travels between the poles, no alteration of tissues or cells has been found in the intervals between the poles. and the changes were confined to the poles and their surroundings. In experiments made I found the action of electrolysis extended to $1\frac{1}{2}$ inches around the poles.

These brief remarks of the electrolytic action on needles will suffice to show how important is the selection of the metal for needles. In some operations the negative needle may be of steel, for others the operator may prefer any other metal to carry out his particular intentions. There are many cases, in which it is essential to use a needle of metal, which neither oxydizes or decomposes

by the electrolytic action. There is only one metal which has all the qualities necessary in such cases, that is platinum. It is not in the scope of this paper to discuss what kinds of metal should be used in the different operations; the only object is to show how platinum needles should be made, in order to answer their purpose.

Platinum is a metal of the color of silver, but less bright. Its specific gravity is 20. It is harder than iron, undergoes no alteration in air, resists the action of acids, and can be rolled into thin plates and wire. It is also ductile, which is the only drawback to its use under consideration. The needles are very flexible and bend easily; for the same reason it is difficult to make a sharp point which will readily penetrate the tissues. If needles of a large size can be used, we have no difficulty, and platinum answers well, but the trouble begins when a needle of a small size is required to be introduced into small nodules, through tough tissues.

Here are some samples of the deficiencies. The needle is often too flexible, and the point dull and fragile, so that on an attempt to penetrate the tissues it either bends or breaks, or the insulation is insufficient and rough. Instrument makers make either or all these errors.

A perfect insulation is made in New York at one place only, viz.: that of Geo. Tiemann & Co., but their beautiful insulation as a rule weakens the needle, though lately that error has been to a considerable degree corrected.

A good needle for our purpose must possess the following qualities:

1. It must be of a small size, in order to enter dangerous anatomical places, without injuring vessels, etc.

2. There must be stiffness, which enables the operator to push through cuticle and fascia into tumors without bending.

3. The point must be sharp, entering the tissues without causing hæmorrhage, a wound or slough.

4. The whole needle with a perfect insulation must be even and smooth.

It will be perceived that the construction of the ideal platinum needle of small size offers many difficulties, which are not easily overcome. Only those who have experienced failures, understand what resistance the tissues offer to the entrance of the needle, and what force is needed to push the needle to the desired position. First are the cutaneous surfaces, which offer resistance and often the point breaks, the shaft bends and the passage of the needle appears almost impossible. After an entrance is effected the needle generally passes smoothly through the soft tissues, but only to encounter a new obstacle by coming in contact with the fascia. Some deep fascia are very tough and offer considerable resistance to the force of the operator, even with stiff steel needles.

Among those points may be mentioned—the cervical fascia, the thoracic fascia, particularly the ligamenta suspensoria, enveloping the mammary gland, the deep fascia under the pectoralis muscle, the fascia lata of the thigh, which is the thickest in the upper and outer side of the limb; the gluteal aponeurosis, investing the gluteus medius. At the linea aspera we find two strong inter-muscular septa. After the needle has overcome these obstacles it meets other dangerous anatomical points of vessels and nerves, through which it must be guided to its proper position before the electricity is allowed to work. The position of the working point of the needle must be in a place far enough from the cutaneous surface and the point of entrance, in order to avoid burning these parts, which would be followed by sloughing ulcers, leaving behind very ugly scars, as mementos. There are also tumors, some having on the outside a capsule, which resist an entrance of almost any force. Considering all these difficulties I have given my orders for a small platinum needle as follows:

The needle to be 3 inches long; size equal to a No. 6 French scale. The working point (non-insulated) three-eighths of an inch long. The point, spear shaped with as fine a point as possible, the widest part of the spear one sixteenth F. inch. The needle must be stiff enough to pass through tissues without bending. The blunt end of the needle non-insulated to be connected with cord by a binding screw. The whole needle well insulated, except at its extremities, as mentioned, smooth and even.

In order to make the platinum stiffer than in its natural state, iridium was incorporated into the platinum wire; of which only $2\frac{1}{2}$ per cent. can be taken up. Iridium is found as an alloy, sometimes with platinum; it is very hard and unmalleable. Its chemical equivalent is 99.

There were many failures by different instrument makers; but by persistence, and at last with the aid of Messrs. Geo. Tiemann & Co., of New York, I am able to exhibit now, a needle which is almost perfect. It is best to use platinum only for the working part of the needle, and to manufacture the shaft of steel. This gives more stiffness to the needle and therefore more direct force can be used to enter the tissues without bending or breaking. In the manufacture of the needle it is necessary to connect the two parts firmly together, and at last to make the insulation smooth, running even from point to shaft.

This needle has answered all practical purposes so far, but there is a possibility that a case may present itself having tissues which resist all efforts and force of the needle. In such a case I use first as a leader a strong steel director which is grooved, having a sharp broad point, both sides below the point are sharp and easily cut its way through the cuticle and fascia. This direc-

tor will pass anywhere and is pushed in the place where the platinum needle is desired to follow. Then the platinum needle follows the director in its groove and is pushed above to its place; the director is withdrawn and the electrolysis is made without any difficulty. The director passes direct and straight, making a smaller hole in the cuticle than an uncertain, bending needle would, and after withdrawal of the needle no opening could be seen after the operation.

With the improved platinum needle and, if necessary, the aid of the steel director, the electrolytic operations can be made with certainty, safety, and success.

THYROIDECTOMY.

Read by title in the Section of Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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In discussing the surgical treatment of goitre or bronchocele I propose to do it in a concise and practical way, basing my remarks largely upon the results of my own experience, and therefore will not deal with it from a statistical, theoretical or classical point of view.

Goitre or bronchocele is met with as one of three varieties: Fibrous, cystic, and pulsating or vascular. Bronchocele associated with exophthalmus not being, except in a few cases, amenable to surgical interference, I will not discuss. Of the fibrous and cystic varieties it is not uncommon to meet with these two conditions present in the same case, thus forming a fibro-cystic goitre. Secondary changes, such as the substitution of gelatinous colloid material for the albuminous, and calcification in the walls of the cysts, and in the fibrous tissue, may modify the variety or form of the goitre.

The surgical treatment of goitre embraces the following operative procedures: injection, electrolysis, incision and drainage, ligation of the thyroid arteries, division of the isthmus or middle lobe, myroidotomy, and removal. (Enucleation).

Indications.—In considering the indications for operative treatment, the character of the goitre matters but little, the latter having a much more important bearing upon the character of the treatment. The indications I will classify in the following manner, namely: Failure of the ordi-

nary treatment usually put into effect in these conditions, which embrace the class of remedies known as alteratives, used both internally and externally, the goitre persistently increasing in size, and causing any of the following symptoms:

1. Tracheal stridor.
2. Dyspnœa.
3. Dysphagia.
4. A rapidly growing goitre, particularly when in a downward direction.
5. Deformity occasioned by the presence of the tumor.

Tracheal stridor, a prominent and distressing symptom in many cases of large goitre, the result of pressure upon the inferior or recurrent laryngeal nerves, calls for reduction or removal of the growth. The former is practically feasible only when the growth is to a great extent cystic. If the growth be purely vascular, sudden suffocating dyspnœa may be brought about by fright; in fact, anything exciting the circulation, thus occasioning increase in size of the swelling, which by pressure upon the trachea, coupled with the contraction of the muscles which depress the hyoid bone and larynx, may cause almost immediate death. Tracheotomy under such circumstances would be anything but an easy operation. To illustrate the force of my remarks, and especially to the part the muscles may play, I cannot do better than refer to a case reported by Dr. Dewes in the *British Medical Journal* for 1879. The patient referred to was found by the Coventry police, apparently dying of suffocation; when on his admission to the hospital a large goitre was found, and a free median incision was made by M. Reed down to the tumor. The dyspnœa was immediately relieved. Upon the evening of the seventh day the dyspnœa returned, the tumor again enlarging, the patient dying in a few minutes. The autopsy showed that the posterior part of the tumor had broken down, allowing a large extravasation of blood which pressed upon the pneumogastric nerves. Here tracheotomy was out of the question, owing to the cervical portion of the trachea being entirely covered by the tumor.

Extravasation may take place suddenly into a goitre resulting in the formation of a large coagulum. Difficulty of deglutition may be caused by either unilateral or bilateral pressure upon the œsophagus, the symptoms thus occasioned simulating those of stricture.

Enlargement, if the tumor is increasing in a downward direction, is especially to be feared, and constitutes a strong indication for interference, as even tracheotomy, with the sole view of offering temporary relief, may be impossible, particularly if such a patient should be the subject of sudden dyspnœa.

Radical operative treatment in the case of a

goitre which has been subjected faithfully to both internal and external treatment with no effect, not causing any discomfort other than that of deformity would not, I dare say, be in accord with the opinions of the majority of surgeons.

I believe that if such a subject is of suitable age, in good general health, and when deformity of the neck is greatly objectionable, thyroidectomy is justifiable if the goitre is unilateral. Where the entire thyroid is involved, constituting a huge mass, I think it is better to make a complete division of the middle lobe (isthmus), having previously ligated upon either side of the point of the proposed incision.

In the case of singers suffering from a small goitre, where the enlargement has taken place in direction of the groove, between the trachea and the œsophagus, the site of the recurrent laryngeal nerves, and which does not yield to treatment, I am inclined to advise removal. The first evidence of nerve irritation is most likely to be huskiness of the voice, therefore here, as elsewhere, relief of pressure for fear of irremedial injury of the nerve or nerves suggests itself.

DIFFERENT OPERATIVE PROCEDURES.

I will speak of the different operative procedures in the order I have given them in the early part of the paper.

Injection.—The injection of any material with the idea of exciting inflammation short of producing suppuration is both a painful and likely to be prolonged procedure and is not certain to result in cure. One, too, which may be followed by suppuration. The injection of any material with the idea of exciting suppuration and consequent disintegration was, before the days of antiseptic surgery, probably the best treatment at our disposal. The position it holds to-day is a far different one. The first objection to be urged against it is its provoking suppuration. Suppuration in a structure like the thyroid gland, where absorption is so soon to follow with its train of septic symptoms, cannot be regarded as desirable. The injection of any astringent liquid into the parenchyma of a goitre is attended by some immediate risk: namely, that of a coagulum finding its way into the circulation and causing embolic obstruction. Electrolysis in certain purely fibrous goitres is unquestionably curative. (See Paper by Dr. Jas. Henric Lloyd, Trans. College of Phys., Philadelphia, 1890). Therefore in cases of this character coming to me for operation, and where the usual treatment, excepting electrolysis, has been given a fair trial, unless there are urgent symptoms demanding immediate and radical relief I advise treatment by the galvano-puncture before doing anything more radical.

I am one who believes that electricity has a place in surgery but, to be given properly, by which manner good results are to be obtained

alone, it must be given by one thoroughly familiar with the subject both practically and theoretically. It is not to be wondered at that so much is said against electricity as it is so often applied by those who know but little about its practical use. The requirements for one who uses the galvano-puncture, I should say, should be

1. Capability in the selection of the cases.
2. A complete knowledge of the subject.
3. Practical experience in its use.

In cystic and vascular goitres electrolysis is not only useless but may be harmful.

Injection and Drainage.—Injection and drainage, done of course antiseptically, where thyroidectomy is for any reason contra-indicated, offers in my judgment, the best treatment for goitres which are purely cystic, also those which are fibro-cystic and where the cystic element predominates; I believe the operation should be done with the patient anæsthetized and not with the use of cocaine. The goitre is to be exposed by a careful dissection, the cyst opened and the walls stitched to the integument. The cyst is now to be thoroughly irrigated with a solution of bichloride, a drainage tube introduced, the cyst cavity packed with iodoform gauze and dressed antiseptically. The details in carrying out antiseptics are to be adhered to most strictly.

In the fibro-cystic goitre where the cystic element is quite as prominent a feature as the fibrous, this treatment will be found in many instances to be followed by degeneration of the fibrous element.

Ligation of the Thyroid Arteries.—After a trial in the ligation of the superior and inferior thyroid arteries it is still an open question if much is gained by this treatment. Certainly in medium size goitres, particularly of the unilateral variety, the ligation of the thyroids is almost as much of an operation as removal, and one, I should say, quite as difficult. I can scarcely see the feasibility of this procedure, except perhaps when done in connection with division of the isthmus or middle lobe.

Thyroidotomy.—Thyroidotomy division of the isthmus or middle lobe between ligatures, I believe to be advisable when the tumor is very large and involves the entire gland. The experience Mr. Sydney Jones (see *Lancet*, November, 1883), has had with this operation is, to my mind, quite sufficient to recommend it.

Excision of the thyroid gland, an old operation dating back to the time of Albueasis, has been and is at the present time regarded as a procedure attended by great risk, both so far as the immediate and the remote dangers are concerned.

The immediate dangers of the operation are shock, hæmorrhage and injury to the neuræd laryngeal nerves. The remote danger is regarded to be chiefly myxœdema. My experience with thyroidectomy has been confined to the re-

removal of unilateral goitre, in none of which cases has myxœdema followed. I must confess I would be apprehensive of this sequel in the removal of the entire thyroid. There is a wide difference of opinion among operators as to the proportion of cases in which it has been seen to follow complete thyroidectomy. That myxœdema will occur after complete removal of the thyroid gland there is absolutely no doubt. This has been proven both by recorded cases, also by the exhaustive experiments of Mr. Victor Horsly. I cannot feel other than that there are but few cases where the operation of complete removal of the thyroid gland would be justifiable, believing as I do that thyroidotomy would suffice. Certainly thyroidotomy should first be done, or at least attempted, when if this fails to offer relief, complete thyroidectomy may be entertained.

TECHNIQUE OF THE OPERATION.

The essential points to be observed in the removal of either a unilateral or bilateral goitre are

1. A clean exposure of the proper capsule of the tumor.
2. Not to open the capsule.
3. Securing the superior and inferior thyroid arteries between two ligatures close to their point of entering the gland.
4. The avoidance of injury to the recurrent laryngeal nerve both when exposing the inferior thyroid artery and in the separation of the growth posteriorly.
5. Tying the pedicle by transfixion with a strong aseptic silk ligature. If the dissection has been a clean one there is no occasion for the use of drainage. For closing the wound I prefer the continuous suture.

Case 1.—Miss A. V., aged 24, school teacher, was admitted to the surgical wards of the German Hospital, June 22, 1887, with a fibro cystic goitre involving the right lateral lobe of the thyroid gland.

The growth was the size of an average fist. She first noticed it six years previous—it has gradually increased in size and at the time of admission was giving her a great deal of trouble in swallowing, as well as paroxysms of dyspnœa. Superficial veins were much enlarged from pressure, growth was movable showing no evidence of adhesions. She was anæmic, otherwise her general health was good. For the past year it had troubled her so much that it was necessary for her to give up teaching, as talking for any length of time excited attacks of dyspnœa. Operation June 23. Growth found to be fibro cystic, which was easily removed. The wound healed rapidly and patient was discharged July 13, 1889.

Case 2.—F. L., aged 43. Laborer. Large fibro cyst in goitre of right lobe of thyroid, began to form twelve years ago. At the time of

admission to the hospital patient was suffering with dysphagia and dyspnœa. Growth was dissected out. Many vessels were tied with catgut. Union by first intention; patient made a good recovery.

Case 3.—Miss A., age—. American. Occupation, teacher in a convent; came under my observation in the summer of 1890, presenting a tumor of the left side of the neck extending from the angle of the jaw above, to the clavicle below, inwards to beyond the median line of the neck and posteriorly to beyond the outer edge of the sterno-mastoid muscle and riding over the large vessels. The middle of the anterior surface of the tumor presented a depressed cicatrix. This growth had been present for several years. Two years ago it was much larger than now; when it was capped a quantity of clear fluid drawn off, and the sac injected with a tincture of iodine. The size of the growth was diminished by the tapping, but not entirely removed. Prolonged suppuration followed the tapping, ending finally in the obliteration of the sac. The growth, which was fibro-cystic in character, now became fibrous as a result of the elimination of the cystic element. My diagnosis was a fibrous goitre involving the isthmus and the left lateral lobe of the thyroid gland. The patient was prompted to seek further relief for the following reasons:

1. On account of chronic hoarseness which at times amounted almost to aphonia.
2. On account of the growth increasing slowly in size.
3. On account of discomfort in both breathing and swallowing.
4. On account of the deformity of the neck.

I suggested a trial of electrolysis before having the operation of thyroidectomy, feeling that the latter operation would be a more difficult one in the present case than ordinarily, owing to the inflammatory process set up by the iodine. The patient was referred to Dr. James Henric Lloyd, who made 15 punctures with the galvano-cautery with a positively negative result. There was left but one course now to pursue, that of the removal of the growth, which I advised and to which the patient agreed. Accordingly, January 29th, 1891, with the patient under ether, after a careful, tedious and long dissection, I removed the growth. There were many vessels to contend with, but by far the most troublesome part of the operation, was the attempt to separate the internal jugular vein, owing to its being adherent to the capsule of the goitre. In this attempt the vein was torn at three points. The bleeding was arrested by the application of hæmostatic forceps which were allowed to remain for 72 hours. The pedicle, as well as the blood vessels, were tied with aseptic silk. Following the operation, there was difficulty in swallowing, which was attributed to the manipulation of the œsophagus necessitated

by the separation of the growth. An irritated cough and high pulse rate (ranging from 140-160), persisted for three days. This I believe was due to nerve irritation, consequent upon the operation.

Case 4.—E. F. C., 64 years, American. Occupation, farmer. A tumor in the anterior portion of the neck was first discovered by the patient about twenty years ago, during which time its growth has been slow. For the past year its growth was rapid, especially since last summer. It never produced any symptoms other than marked difficulty in breathing. For the past year the patient has not been able to sleep on his back or right side. He was admitted to the German Hospital, March 23, 1891. The tumor, the size of a large foetal head, occupied the anterior or left lateral region of the neck, extending from the angle of the jaw to two inches below the clavicle. There was laryngeal stridor with aphonia and painful paroxysmal of dyspnoea. A diagnosis of cystic goitre was made. Owing to the advanced age of patient, and his general condition, by no means favorable for enucleation, I decided to open and drain. His dyspnoea was so severe it was not advisable to give an anæsthetic until the tumor was aspirated, thus relieving the pressure symptoms. This was done the following day and I drew off a semi-gelatinous fluid tinged with blood. Ether was then given and cyst was opened, and its walls stitched to the skin. This was followed by considerable hæmorrhage which required the packing of the sac with iodoform gauze around the drainage tubes. After this the growth was reduced to the size of an ordinary fist. The patient progressed slowly, with a temperature fluctuating between 99 and 102°. The pressure symptoms were relieved completely. He is still under observation and now the tumor is the size of a hen's egg and there is a sinuous track occupying the seat of the drainage tube. The tumor occupied the anterior and left lateral region of neck. A diagnosis of cystic goitre was made; owing to the advanced age of patient, and his general condition, by no means favorable for enucleation, I declined to open and drain the cyst, which was done the following day. I first operated and drew off a semi-gelatinous fluid tinged with blood. I then opened the cyst and stitched the walls to skin. This was followed by considerable hæmorrhage, which necessitated the packing of gauze around the drainage tube.

ACETANILIDE is now being used in lieu of iodoform in some hospital practice in the form of a fine powder on some kinds of sores.

DR. E. S. ELDER, of Indianapolis, was elected president of the Mitchell District Medical Society at its recent meeting at West Baden.

CÆLIOTOMY (ABDOMINAL SECTION) FOR RUPTURE OF THE PARTURI- ENT UTERUS.

Read by Title in the Section of Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY HENRY C. COE, M.D.,
OF NEW YORK.

Introduction.—Although the literature of this subject is quite exhaustive, most authors deal with the etiology and pathology of rupture of the uterus, rather than with the treatment, and much of the teaching with regard to the latter antedates the era of modern abdominal surgery. The writer feels some hesitation in writing upon this theme, as it has been already ably presented to the American Medical Association by Dr. Wm. H. Walker and Dr. C. A. R. Reed, in papers read before the Obstetric Section. The writer's purpose in reintroducing the subject before the Surgical Section is to have it discussed from the broad standpoint of *general surgery*. This is entirely proper, since rupture of the uterus is to be considered in the same light as rupture or other lesions of any other of the abdominal viscera. It is preëminently a *surgical emergency*, and should not be studied from its gynecological (or obstetrical) side alone. When Lawson Tait feels justified in proposing Porro's operation as the proper treatment for placenta prævia, we may well ask: "Is simple expectant treatment applicable to the far more formidable obstetrical complication, rupture of the uterus?" Note that the paper deals with rupture of the *parturient* uterus, and not with injuries of the organ before labor. This is an important distinction, to be borne in mind in the discussion.

The writer bases his paper entirely upon his personal experience—that of four cases (seen within a period of eighteen months) in which abdominal section was performed. One case was successful, the patient being now in perfect health.

Brief outline of cases:

Case 1 (reported *in extenso* in *New York Med. Record*).—Rupture due to undue interference in the first stage (forceps and attempted version), the child being of unusual size. Operation two hours after the accident, the patient being in collapse from active internal hæmorrhage. The child's head had escaped from the rent, which extended from the cervix through the left broad ligament, half way to the fundus. Child extracted through the rent, after application of rubber cord. Uterus removed and pedicle treated by the extra-peritoneal method. On account of extensive laceration, the entire stump sloughed out, but the patient made a good recovery.

Case 2.—Cause of lesion identical with that in Case 1. Injury not recognized until twenty-four hours after the birth of the child, when the patient was already septic. Cœliotomy. Trans-

verse tear on posterior aspect, 4 inches long, in lower segment, with commencing peritonitis. Rent sutured, and thorough irrigation and drainage. Death from shock twelve hours later.

Case 3.—Moderate contraction of anterior conjugate, with large child. High forceps unsuccessful. Delivery after difficult version. In removing an adherent placenta the accoucheur withdrew a coil of small intestine, which prolapsed through a rent in the posterior wall of the uterus. It was replaced (as was supposed), and the opening was plugged with iodoform gauze. Abdominal section was then regarded as unjustifiable, on account of profound collapse. The writer saw the patient eighteen hours later, found her in fair condition, the upper portion of the vagina being filled with intestine. He proposed and performed cœliotomy at once. There was a transverse tear posteriorly in the lower segment, extending between the bases of the broad ligaments. It was too extensive to suture, so both broad ligaments were clamped, and the uterus was extirpated *in toto* in five minutes. It was found that the intestine had not been replaced, but had been nipped by the edges of the rent, so that at least 3 feet were black and gangrenous. Irrigation and gauze drainage per vaginam. Death from shock ten hours later.

[The above were private cases.]

Case 4 (Maternity Hospital).—Spontaneous rupture during normal labor, not recognized. Collapse five hours later, but no extensive hæmorrhage. The writer saw the patient twelve hours after the accident, and diagnosed rupture of the uterus with internal bleeding. A consultation of the attending staff was held, and the unanimous opinion was that there was an extensive laceration into the left broad ligament, and that active hæmorrhage was in progress, which it was necessary to arrest. There was doubt as to whether the rent extended into the peritoneal cavity or not. Exploration advised. This was conducted rapidly. No blood found in the abdominal or pelvic cavity. There was an immense hæmatoma of the left broad ligament, extending upward into the corresponding iliac fossa. Abdominal wound closed and vagina tamponed with gauze, although *there had not been any external hæmorrhage whatever*. Death from shock.

Here follow extended references to the literature of the subject, from which and the cases reported are drawn the following inferences:

Many cases of spontaneous rupture are doubtless unrecognized by the general practitioner. Profound shock after delivery should always awaken suspicion, even if there is only moderate external hæmorrhage, and a thorough examination should be made. Text-books give rules for recognizing rupture only *during* parturition.

The rules laid down for the treatment of rupture are uncertain and confusing. The tendency

of the practitioner is toward purely expectant treatment. He would pack the vagina with gauze and wait. This course is too often fatal. The emergency is a *surgical* one, and is to be treated according to the ordinary rules of surgery.

The fact that successful cases of cœliotomy for rupture of the parturient uterus are comparatively rare, is no more an argument against the operation, than if it was applied to gunshot wounds of the abdominal viscera. In analyzing the unsuccessful cases, it will generally be found that operative interference came *too late*, *i. e.*, from eight to eighteen hours after rupture. The writer's successful case was as unfavorable as could be imagined, but the patient was operated upon promptly, as soon as the lesion was discovered. Two methods of active treatment are now recognized and practiced, viz.: 1. Drainage per vaginam. 2. Abdominal section, followed by either, *a*, drainage; *b*, section of the tear; or *c*, amputation of uterus. Simple drainage has some powerful supporters (mainly in the Vienna school), and the statistics are apparently convincing, but it is not capable of general application to all cases, and the indications are not always clear, because without opening the abdomen it is frequently impossible to determine the following important points: 1. The nature and extent of the tear; 2. The presence of active hæmorrhage; 3. The presence of blood and amniotic fluid in the peritoneal cavity. [It is assumed that the uterus has been emptied.] The writer thinks that abdominal section is indicated under the following conditions:

I. Before the uterus is emptied.

1. When the placenta or *any* portion of the foetus has escaped from the rent. Attempts at manual delivery only increase existing shock and destroy the patient's chances after section, as invariably shown by records of unsuccessful cases.

2. When there is evidence of progressive internal hæmorrhage.

II. After the uterus is emptied.

1. When there is extensive prolapse of the gut through the tear (as in Case 3).

2. In all complete lacerations (especially in those involving the broad ligaments), except small tears low down, near the vaginal fornix (as in Case 2), where good drainage can be maintained.

3. In incomplete tears in which the broad ligament is extensively involved (as in Case 4), and there is evidence of progressive hæmorrhage. [This point must remain *sub judice*. Only one other beside the writer (Peters) has opened the abdomen in such a case. His patient died, and the report of the case provoked considerable adverse criticism. In the discussion before the Vienna Obstetrical Society, only Gustav Braun expressed the opinion that section was justifiable when there was no evidence of progressive inter-

nal bleeding,*and it was not certain whether the tear was complete or not.] Parvin's summary is a comprehensive one, viz.:

"Probably the solution of the question is this, that where the tear is in such a position that vaginal drainage is perfect, the abdomen need not be opened; but if such drainage is impossible, or imperfect, then section is indicated."

What shall we do after opening the abdomen?

1. Arrest hæmorrhage, either with forceps or the temporary rubber ligature.

2. If the tear is small (2 inches), and is low down in Douglas' pouch, drainage per vaginam may be indicated.

3. If the tear is clean-cut, without contusion of the edges, and does not involve the cervix or broad ligaments, it may be closed with deep and subserous sutures.

4. If the tear is not low down, is extensive, with contusion of the edges, and especially if a portion of the fœtus protrudes, amputation of the uterus, with extra-peritoneal treatment of the stump, is indicated. (The child can be extracted through the rent before removal of the uterus (Prêvat) or afterwards (Porro).

5. In extensive transverse tears in the lower segment (as in Case 3), and in tears beginning in the cervix and extending upwards through the broad ligament, the writer would strongly urge the propriety of total extirpation of the uterus as the operation *par excellence* (as it is in many cases of hystero myomectomy), for the following reasons:

1. It requires less time than Porro's operation, and is quite as easy, especially if the patient is placed in Trendelenburg's position. There should be no greater shock or loss of blood.

2. All the contused tissue is removed, which if left behind in the stump, will inevitably slough and imperil the life of the patient (as in Case 1).

3. Drainage is perfect. After thorough irrigation and toilet of the peritoneal cavity, it can be closed, drainage being maintained per vaginam with iodoform gauze, as after vaginal hysterectomy.

Conclusion.—The writer deprecates any intention of recommending a heroic method of treatment to the entire exclusion of the more conservative. He is an avowed conservative in abdominal surgery, but believes that rupture of the parturient uterus is a desperate emergency, in which a fatal issue is the rule, and that it requires prompt and energetic treatment according to the rules of modern surgery. The fact that the statistics of cœliotomy in these cases have shown a large mortality, is not an argument against the operation. In every case the accoucheur, if not himself a surgeon, should without an instant's delay summon experienced counsel, and explain to the family that immediate resort to abdominal section may be necessary. Only by prompt interference

can we improve statistics, and thus elevate the operation above the level of a hopeless and, apparently, unnecessary surgical experiment.

SOME POINTS IN THE SURGICAL TREATMENT FOR THE RADICAL CURE OF HERNIA.

Read in the Section on Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY AUGUSTUS P. CLARKE, A.M., M.D.,
OF CAMBRIDGE, MASS.

One of the most important features in the surgical treatment for the radical cure of hernia is the selection of the proper material for sutures. The sutures in all cases should be aseptic. The wound made by the incision should also be kept aseptic. The operator should have knowledge of the manner in which the sutures have been made, and in order to have such knowledge he should superintend their final preparation. Sutures which have been prepared and are sold in shops should in no event be trusted, notwithstanding the careful manner in which they may seem to have been prepared. No one, except the surgeon, or his immediate assistants who are to use them, and who have taken occasion to make most careful observation, is at all likely to appreciate this necessity, and to carry out in every detail measures necessary for assuring their preparation in such a manner that they can be relied upon as being surgically clean and perfectly free from germs. Experience has demonstrated that the best material for buried sutures is that obtained solely from animal substance. Catgut and tendon when properly prepared afford the best material as is yet known for such sutures. Considerable experience is required in chromicising them. If the sutures remain long in the acid they become hard and offer too much resistance to the action of the tissues. The same effect occurs when the quantity of acid is in excess of the due proportion. If, on the contrary, the sutures are not sufficiently chromicised they undergo absorption before complete union of the coapted parts of the wound takes place. Silk ligatures, however carefully prepared, should not, as a rule, be employed in operations on hernia; their substance is not akin to those of the tissues into which they are to be inserted; they are liable to be the medium either directly or remotely of sepsis, and are rarely, if ever, absorbed. In cases in which they have been used, it has been necessary, for the most part, to establish some means of drainage. Such expedients serve to prevent the occurrence of immediate adhesion of the tissues, and to render the line of union weak and yielding, and consequently to afford but little protection against a return of the hernia. The

same may be said when horse hair and certain other materials are used for such sutures. It is true that for affording immunity against the recurrence of the hernia, the internal ring may be embossed by the inverting of the sac on its peritoneal surface. This measure may, for the time being, be of some service, especially in a case in which a well fitted truss is worn. Such unnatural coaptation of parts is liable, however, to yield before the super-incumbent pressure of the abdominal viscera and thus to cause a return at length of the hernia. Application of quilled sutures falls far short of accomplishing what is most to be desired, for the adoption of this method of procedure, when silk, or like substances are employed, has to be supplemented by some special provision for drainage to the wound. One of the features which I here insist upon to be achieved is that the several different tissues be coapted, each in its proper order and that direct and immediate union be secured without the necessity of having to resort to any method of drainage whatever. Another important feature to be secured in the operation is the restoration of the obliquity or the valve-like form of the inguinal canal, and also of the internal and external abdominal rings. Attention has been called to the importance of this measure, but as yet, I believe, it has not been generally appreciated. This may be effected by free dissection proceeding from the internal ring. In cases in which the tissues have undergone serious changes, or the parts have become distended, deformed, thickened or attenuated, much difficulty will be encountered in accomplishing such restoration. Every effort, however, should be made to bring back the canal as near as possible to the typical one, as regards length, diameter and obliquity. In those cases in which the canal has become tortuous, or in which the opening is formed at an undue angle to the parietes of the abdomen, and the parts are not reformed, but are left in abnormal condition, the operation undertaken for the radical cure will prove to be of temporary benefit only. Statistics are sometimes offered by different operators to show that certain methods of practice are attended with unusual success. Statistics can be of but little value when the individual operators select cases with the view of showing favorable results of their special methods of operating. In a case in which the sac is to be removed the cord should be freed as high as possible even if the peritoneum has to be impinged upon. The sac should be sewed off by means of aseptic animal sutures; and if the other steps in the operation have been properly taken there will be scarcely any danger of a return of the hernia. There are several advantages in the method of removing the sac. Prominent among them is the greater facility for inspecting its contents and for guarding against the possibility of reducing parts

which may be in a state of inflammation. Such a condition of the parts is particularly apt to occur in cases of strangulated hernia, after prolonged taxis or other measures for relief have been undertaken. When the hernia has been properly reduced, the sac should be regarded only as an unnecessary incumbrance. The sac is formed originally from the parietal peritoneum, which frequently becomes distended and thickened. The various changes in its nutrition and vascularity often lead to irritation, inflammation and adhesion, according to circumstances and accidental conditions. In all cases, after opening the sac the surgeon should see whether the circulation returns. If the parts have been too long compressed and there is much danger of sloughing it will be advisable to resort to resection of the necrosed portions and not to assume risks of returning them. After opening the sac and relieving the constriction, and before making reduction, the contents of the sac should be carefully examined. If there is evidence of inflammation or an effusion of lymph, free irrigation with mercuric bichloride should be had recourse to. The sac should then be sewed across at its neck with animal suture, and be excised. Different methods of operating for the radical cure of hernia from time to time have been reported. Emphasis is often laid upon the adoption of the most careful antiseptic precautions. A more particular examination of such reports almost invariably reveals the fact that some method of drainage has been employed. Among the methods observed is the one in which the horse-hair drain left in the canal, or "gauze plugs" connected with the wound; and that the wound united by "granulations from the bottom." The failure on the part of the operator to keep the wound aseptic must necessarily render the line of union weak, the parts in large measure devoid of vitality, and thus incapable of overcoming the pressure which is the cause of the recurrence of the hernia. This is the reason no doubt why so many different methods for the radical cure of hernia have been devised and why each method of operating, for the most part undertaken by a different surgeon, so often proves unsatisfactory. In some cases of femoral hernia excision of the sac is almost imperatively demanded. In those cases in which Macewen's method is adopted the thickened mass is liable to set up more or less irritation, and to become the source of much inconvenience.

When the sac is removed the ring and canal can be narrowed, and sutures can be introduced in close proximity to the vessels without causing injury or disturbance to the circulation. Another advantage, according to Mr. Poland,¹ is that it allows the closure of the neck of the sac, and thus effectually prevents all hæmorrhage from the wound into the peritoneal cavity. After the sac

¹ John Poland, F. R. C. S., Braithwaites Ret., Part 98, page 124.

has been removed the loose folds in the vicinity can be more nearly approximated; the exudation of plastic lymph readily closes the wound effectually from any communication with the abdominal cavity. After the edges of the pillars have been refreshed they may be brought together, and retained by aseptic sutures. By this means the canal is reformed but narrowed, and becomes an effectual barrier against the recurrence of hernia. This method is evidently of far more importance than the one which seeks to utilize the sac by invaginating it in the canal and by converting it into a pad or fixing it as a boss over the internal ring. Of course, in cases of chronic hernia, in which there has been much inflammation, considerable difficulty will be experienced in separating the sac from the surrounding parts. If, however, much care be exercised, and a liberal use of the aseptic sutures be resorted to, the sac can be separated and be removed, to a certain extent, without incurring the risks of gangrene, suppuration or inflammation, and the operation will therefore not appear so difficult or dangerous as some writers would lead us to believe. In a recent case in which the hernia is quite small, the sac and hernia may have passed into the abdomen and so have disappeared. These cases may be operated upon without our interfering with the sac. The edges of the pillars should in such cases be refreshed, and approximated by aseptic animal sutures. The other parts are sewed together according to the method already referred to. In congenital cases the cord and sac are frequently found so blended with each other that to separate the one from the other is often most difficult and tedious. In such cases, when there is no appearance of recent lymph, portions of the sac may be left. The remaining fibres, for the most part, usually undergo absorption or degeneration. This measure in the operation is quite different from the one which, as said before, seeks to plug the canal and internal ring by means of the retained or inverted sac that is liable to form a painful or hardened mass in connection with the ring and canal. In operations for the cure of hernia the use of wire sutures is unnecessary, and should not be encouraged. The use of wire sooner or later becomes the source of inconvenience, if not of serious trouble, and notwithstanding the efforts made in other respects to keep the wound aseptic, their presence is followed by irritation or ulceration, conditions that will necessitate their early removal, and thus compromise the usefulness and advantages that should be derived from the surgical measures undertaken. Other methods of treating the sac have been proposed. The cases in which the method by torsion of the sac can with any degree of safety be resorted to are too few for general considerations. In every such case the operator of course must be a law unto himself. In

conclusion I would say that every operation, for the radical cure of hernia, in which the wound is kept strictly aseptic, including the employment of thoroughly aseptic animal sutures, the results will be most satisfactory, and but little danger is to be apprehended of a return of the hernia. These favorable results may be expected to follow in the cases in which the sac has, as far as possible, been excised, without injury to the cord or other parts. In all cases expected to be successful the operation should be so conducted that no drainage, however simple in its details, should in any way be required. The necessity of observing this principle in operations for the cure of hernia has been urged by my friend, Dr. H. O. Marcy.² He says the "Coapted surfaces held aseptically at rest, readily tolerate the limited effusion which is utilized in the process of repair. The elimination of the drainage-tube renders the complete closure of an aseptic wound possible, and prevents its further extraneous contamination. Repair ensues as in a subcutaneous wound. The advantages of this method in the treatment of the wound is the assurance of non-infection. By every method of antiseptic dressing with drainage all surgeons have admitted the great difficulty, and, in children, the well nigh impossibility of retaining the wound aseptic." The results of the operations in the hernia cases occurring in Dr. Marcy's practice with which I have been connected, and also in those in my own for the past twenty years, fully justify the conclusion here reached. By the observance of these principles of aseptics in operative treatment for the radical cure of hernia, Dr. Marcy has, according to my judgment, attained a success that has scarcely been paralleled.

ARISTOL: SOME OF ITS USES IN SURGERY.

Read in the Section of Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, at Washington, D. C., May, 1891.

BY WILLIAM C. WILE, A.M., M.D.,
OF DANBURY, CONN.

My attention was first called to the value of aristol in the treatment of surgical cases, by Dr. Eichhoff, of Elberfeld, Germany, and Lowenstein, of Vienna, whose reports were published in the early part of 1890. I have always been a firm advocate of the value of iodoform in surgery, but I had become well convinced of the fact that it was, in many cases, a source of great annoyance, from its repulsive odor, to a great majority of cases, and having seen many, where its poisonous effects were apparent, I at once became impressed with the value which must pertain to a remedy which was free from toxic effects, was inodorous and as valuable an antiseptic as iodo-

² Treatise on the Radical Cure of Hernia, page 87.

form. One of the very first cases in which I used it was of such a character, and the results were so satisfactory, that it almost immediately displaced iodoform in my practice, and from that day to this I have used aristol entirely when it was at hand and available.

Dr. Hobart Armory Hare, says: Experimental and practical clinical experience have shown that it can be used in all instances where iodoform can be applied externally, and it is said to possess the advantage of being almost entirely harmless to man, although it is a powerful parasiticide.

Dr. C. W. Allen, New York, in a paper read before the American Dermatological Association, gave the results of his experience with aristol, and summed up with the statement that it seemed to possess valuable cicatrizing, granulating and stimulating qualities, was void of the objectionable odor of iodoform.

Dr. Alois Pollak has employed aristol as an antiseptic in twenty-two cases of unhealthy wounds, abscesses, minor surgical operations (such as removal of small tumors or enlarged glands), phlegmonous inflammations and varicose ulcers, and is enthusiastic in praise. He used the drug in the form of a powder, or mixed with ether or vaseline. In all of the cases in which it was employed there was no reaction; and fever, if present, disappeared within twenty-four hours. No pain was experienced in or around the wound, and healthy granulations were rapidly formed. The author regards aristol as an excellent substitute for iodoform; its advantages being that it has no disagreeable odor, is effective in much smaller quantities, and a thin layer of the powder is sufficient to cover the wound.

Dr. Boufill calls attention to the great value of the drug in burns; a 10 per cent. salve of aristol proving eminently efficacious.

Dr. F. Goldmann mentions the use of aristol in speaking of the frequency of burns received during laboratory work; these are sometimes of a peculiarly severe type, but a 5 or 10 per cent. salve with lanoline effected a painless and comparatively quick cure, almost invariably.

Dr. Robert T. Morris, of New York City, after testing aristol in the hospital of the New York Presbyterian Graduate School, says: "It seems after a careful series of experiments that it is superior to iodoform in all classes of surgical cases, in which the former was applied," and Dr. Manley, of the same city, in an article published in the *New England Medical Monthly*, takes about the same ground. The case referred to was that of a little boy, Tommy H., aged 9 years, who had met with a frightful laceration of the left leg. He was with a mate playing on a flat car in the yard of the Housatonic R. R. Co., in the city of Danbury. The car was isolated

on a side track, and the boys were running and jumping on and off, dancing on the platform and the like. After a while they tired of their exercise, and seated themselves on the end of the car with their feet hanging over it. Without warning and without being seen by the employes, a car loaded with lumber was backed up to the side track. This car was loaded with loose lumber and over the front the irregular ends protruded. Before the boys realized their danger the car was upon them, and some of the projecting boards caught Tommy's leg. It was almost immediately released, and the injured boy taken to his home while I was sent for. On my arrival I found on a superficial examination that his injury was a very severe one, and that it was advisable to have him taken to the hospital, especially as his home was a poor one, which was done. On arrival at the hospital, he was given ether and a careful examination was made, with the following result. It was found that almost all of the soft parts of the leg were fearfully lacerated, and that the tibia had sustained a transverse fracture. It did not seem that it would be possible that his leg could be saved, but remembering that children have wonderful recuperative as well as reparative power, I determined to make the effort. All of the macerated tissue was carefully dissected, trimmed away, and the wound carefully cleansed. Then the torn ends of the muscles were coaptated as well as possible, the tendons united, and the integument replaced as much as was possible. Of course all of this took a long time, and was done with full antiseptic precautions, and the suturing was made with catgut. The integument was so badly torn and lacerated in some places that it had to be trimmed, and there were some bare spaces. The whole of them was covered with a heavy coating of aristol, enveloped in antiseptic cotton, and put up in a plaster of Paris bandage, setting the fractured bone at this time. This dressing was not removed for one week. There was no elevation of temperature, and the boy required very little anodyne to keep him quiet.

On the removal of the dressing at this time it was found that a most wonderful metamorphosis had taken place. Union had been established over a considerable extent of the integument, and all of the tissues beneath seemed to have united firmly. There was simply no odor to the wound, and quite firm bony union had taken place. Over the spaces which were denuded of the integument healthy granulations were springing up all over, and the prospect was very bright for saving the limb. It was washed off carefully with bichloride solution, one to two thousand, aristol freely dusted on, and plaster of Paris again applied as before, leaving windows for the purpose of frequent dressing of the denuded parts. This was left on for one week more, when it was found

that union in the bone was so firm that the plaster of Paris splint need not be further used. It was dressed as before, and this treatment continued for another week when all was perfectly healed, and in four weeks from the time of his entrance into the hospital he was discharged cured. When we take into consideration the extent of the injury to the soft parts, I am sure that you will agree with me that this result so readily attained was little short of the marvellous.

The next most gratifying case in which I used it was that of James A., who was suffering from a very large specific bubo which was gangreneous in its character. He had been under the charge of several physicians, and his life seemed to hang by a single thread. The cavity was well washed with Marshland's peroxide of hydrogen and packed with aristol. This was renewed every day and the bubo not only rapidly healed, but the general condition of the patient immediately improved. All the internal medication I gave was a dessert-spoonful, three times a day, of the elixir of three chlorides, and a generous diet.

I have used it in varicose ulcers of the leg with the most charming results. In this troublesome affection I firmly believe that no other treatment will bring about such gratifying results as aristol and the rubber bandage. Its effect is immediate and rapid.

A little girl was horribly burned on both legs from her clothes catching afire. The fire was quickly extinguished, but the burns on the limbs were very severe, extending to the second degree. I made an ointment of aristol one drachm to lanolin one ounce and a half, and spread it thickly over the whole inflamed surface. The limbs were then put up in absorbent cotton, and roller bandage, which was not taken off for one week, when it was found that the whole surface had healed, except two places the size of hen's egg, which subsequently healed under a few dressings. I have used it in five other cases of this character with equally good effect.

In recent wounds resulting from traumatism of any character it is probably seen at its best. Its action is peculiar. Take a given wound which has been carefully cleaned by antiseptic methods, stitched together, and aristol dusted on the surface; when the next dressing is made the following will be observed: There has been no exudation. The aristol is as dry as when it was first put on. The wound is also as dry, or even dryer, for where there was a particle of moisture the aristol had sealed it in, as it were; and the wound had healed while perfectly dry. I have never seen a case of injury which was treated by aristol that did not heal perfectly and entirely, provided I had been careful to make it perfectly aseptic prior to its application. In conclusion, aristol has many advantages over iodoform, inasmuch that it is perfectly non-poisonous,

has no odor, does not irritate, is fully as good an antiseptic as iodoform, and in our opinion the ideal one.

LINEAR CRANIOTOMY (MISCALLED CRANIECTOMY) FOR MICROCEPHALUS.

Read in the Section of Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY W. W. KEEN, M.D.,

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I have entitled this paper "Linear Craniotomy" instead of "Craniectomy," the word proposed by Lannelongue and formerly used by myself. The operation is practically a long incision in the skull, the removal of a part of the bone being merely incidental to its being a hard instead of a soft tissue. The termination "ectomy" usually and of right signifies the entire removal of the part preceding this termination, *e. g.*, oöphorectomy, omphalectomy, nephrectomy, etc. Removal of the cranium (as craniectomy means) being scarcely intended or done, our nomenclature should fit the facts. Dr. Bauer uses the word craniotomy in reference to his case (see below), but trephining is, I think, the proper one to describe his operation.

In *The Medical News* of November 29, 1890, I published a case of linear craniotomy for microcephalus. The object of the present paper is to report the later history of this case and two additional cases that I have had, as well as brief notes of one kindly furnished me by Drs. B. Sachs and A. G. Gerster, of New York, and another similar furnished me by Dr. J. C. McClintock, Professor of Surgery in the Kansas Medical College, making with Lannelongue's two cases and Wyeth's case, eight in all that have been done so far, and to refer to two other cases done before my own, for the same disorder and with the same intention, but by methods which I cannot think should be classed as craniotomies.

Case 1.—(For earlier history see *The Medical News*, November 29, 1890.) Since the operation this child has certainly improved steadily and considerably, but not at all to the extent of the case reported by Lannelongue. She screams almost none at all, sleeps better, notices a watch when held before her, observes things about her, and has used a number of words, occasionally but not constantly. She drools and screams but little and has almost lost the restless wringing of the hands which was so marked a peculiarity before the operation.

February 17, 1891. A precisely similar operation to the first was done upon this patient at the Jefferson Hospital. The improved forceps enabled me to do it in thirty-five minutes instead

of an hour and a quarter. She was entirely well in five days. No drainage was used.

March 24. The child is slowly improving. I do not see that her progress has been any greater since the second operation than before.

Case 2.—K. K., girl. Patient of Dr. F. X. Dercum.

Condition, May 23, 1890.—Age 1 year (when first brought to Dr. S. Weir Mitchell at the Orthopædic Hospital and Infirmary for Nervous Diseases). Very small. Makes no attempt to walk or sit; moves arms well; feet and hands cold; muscles flabby. Circumference of head $14\frac{1}{4}$ inches; diameter, biparietal, 4 inches; occipito-frontal, 4.5 inches. Knee-jerk slight, sensation good, no clonus, no rigidity. Fontanelle closed. Nose-bridge very wide. No mental development; hearing and vision good; does not speak at all; disposition good. Passes water and stools without notice. Spine straight. Five teeth. A general restlessness comes on at times; usually excessively cheerful.

Both parents alive and well. Father and mother are first cousins. No venereal history; no consumption in the family history except a sister of the father who contracted consumption. The mother has been married five years and has two children, of which the patient is the younger. Her brother is 4 years of age, and is strong. He was breast-fed; is hydrocephalic; circumference of head 53.3 cm.

The patient was born at term. Labor lasted twenty four hours and was very hard. No instruments were used. Patient was very small in size. No palsy, but very weak. No fontanelle existed at birth and her head has not grown since, though her body has. She was breast-fed for three months, and since then bottle-fed. She had a cold in her head for six months.

Condition, December 1—Nineteen months of age. Cannot sit alone; constantly in motion; 12 teeth. Circumference of head 36 cm. ($14\frac{1}{4}$ in.). Biparietal, 10.3 cm. ($4\frac{1}{8}$ in.); biauricular, 10.2 cm.; bitemporal, 8.3 cm. ($3\frac{1}{2}$ in.); occipito-frontal, 11.9 cm. ($4\frac{3}{4}$ in.). Circumference of chest, 38.2 cm. ($15\frac{1}{8}$ in.). Height, 69.8 cm. (27.5 in.). Weight 12.5 pounds. [I append the following normal measurements at birth from Schroeder's *Lehrbuch der Geburtshülfe*: Length 50 cm. Head, bitemporal, 8 cm.; biparietal, 9.25; occipito-frontal, 11.75 cm.; circumference, 34.5 cm.] Top of head quite prominent. Can hold things in her hand; cannot feed herself. Moderate contraction of flexors of both feet; legs not paralyzed, knee jerk absent, no ankle clonus. In repose idiotic expression. Frontal lobe re-creating. Two convulsions this summer, two last winter, each time with teeth. Has the expression of a precocious idiot. Attention can be won, but only momentarily. Mind and eye flit from one thing to another quickly.

Operation at the Infirmary December 3, 1890.—An incision was made one inch to the left of the middle line, parallel to the sagittal suture and six inches in length. A curved incision was then made from the anterior end of this line downward so as to lift a frontal flap, the scar of which would be hidden by the hair. A half-inch button of bone was removed by the trephine, and from this anteriorly and posteriorly a furrow a quarter of an inch wide was cut out of the bone, extending to within an inch of the supra-orbital ridge and an inch above and to the left of theinion. The length of the furrow was five inches.

The amount of hæmorrhage from the scalp was very slight, much less than I have found it in adults. The bone was very thin, about one to one and a half mm. only, but bled freely. Opposite the parietal boss the dura was very adherent to the bone, but at all other points was separated easily. When the point of a pair of scissors was put under the flap of bone thus loosened and the handle of the scissors let down gently, the simple weight lifted the flap perceptibly. The periosteum corresponding to the bone removed was cut away. The dura had not been opened, and appeared normal.

A few strands of horsehair were placed in the furrow and the wound dressed. The operation lasted half an hour. Temp. at its close 98° .

13th, (10th day). The wound healed kindly and quickly, and in five days the stitches were out. During the process of healing the child showed unusual fluctuations of temperature, the highest being, however, only 100.8 , for which no apparent cause could be found. After keeping the child a few days longer in the hospital to be sure of a safe recovery she was sent home to day. The attendants at the hospital are decidedly of the opinion that she is quieter and calms at her head much less than she did before the operation, though for myself I can scarcely see much difference.

March 2, 1891. The child has improved very much in general mental condition, but not so rapidly as I could wish. Accordingly, to-day I did a linear craniotomy on the other side of the head in precisely the same manner as the former operation. The operation was wholly completed in twenty minutes by the new forceps.

24th. The evening of the operation her temperature suddenly rose to 104.6° , falling to normal in four days. The rise in temperature was of course too sudden and too great to be the result of the operation. The cause of it was soon discovered to be a marked intestinal disorder which had begun the day before the operation. This fact was not communicated to me by her mother. No drainage was used and the wound was entirely well and the stitches out in five days. Her progress is very much the same as in case 1.

Case 3.—J. L. H., male, aged sixteen months. Was first seen by me on January 10, 1891. In the fifth month of her pregnancy his mother's friendly sympathies were deeply stirred by seeing the dead baby of a friend, and the seventh month of her pregnancy she was startled by being nearly run over. Her labor was normal, lasting three hours; no instruments were used. The child's weight was between seven and eight pounds. The anterior fontanelle was very small at birth and closed at or before seven months of age. The child was breast-fed for three weeks and after that bottle-fed. At about three weeks, six weeks, and three months of age had one or more convulsions. He was very peevish and fretful up to twelve months of age, but of late has been much less so until some recent trouble, presumably his teeth. His parents state that he was a "blue baby" for a year, but Dr. S. Striker, his physician, informs me that it was not discoloration due to a patent foramen ovale, but a constant and very marked mottling of the skin from defective circulation. The child has had attacks of very poor circulation, but of late these have diminished very much. He has also been subject to attacks of apparent pain and of restlessness continuing for a day or two.

Status Præsens January 10, 1891.—A well-nourished, apparently hearty boy; no contracture or other deformity excepting his head. Viewed in front the skull is markedly conical, face broad, top of skull narrow and arching. Circumference on the shaven scalp, 38 cm. (15 in.). Diameters: Occipito frontal, 13.5 cm. ($5\frac{5}{8}$ in.); biparietal, 9.8 cm. ($3\frac{7}{8}$ in.); bitemporal, 8.6 cm. ($3\frac{1}{8}$ in.). The child drools all the time, has never attempted to stand, falls unless held up, and scarcely even holds his head up. He has never talked. He moves his extremities, but very sluggishly; moans a little, sleeps poorly; head and eyes commonly turned to the left and upward, except in the attacks of apparent pain, when they go to the right, and, as his father expresses it, "he twists himself all up." These attacks are not epileptic in character. He yawns often. His attention can be attracted, but with difficulty, and only for a moment. On shaving the head, the broad furrow behind the coronal suture is very marked, and the occiput protrudes posteriorly much more than usual.

Operation, January 16.—Present; Drs. Striker, J. C. DaCosta and Mills. Dr. W. J. Taylor, as usual, assisted me. I thought that the child's circulation had at times been so impaired, that especial care was necessary in administering the anæsthetic, so I requested Dr. Coplin to give the ether, on account of his large experience in the Jefferson College Hospital. After the same method as in my former cases, I cut a groove $\frac{3}{4}$ of an inch to the left of the middle line, reaching from $\frac{3}{4}$ of an inch above the supra-orbital ridge well

back, nearly to theinion. Its length was $6\frac{3}{8}$ inches. In biting the bone I used a pair of forceps devised by me for the purpose, which answered admirably, so that instead of an hour and a quarter as in my first case, and fifty minutes in my second, I did the operation in thirty minutes. The bone bled quite freely, but not alarmingly and the bleeding stopped spontaneously. No other incident occurred during the operation, except that the child's breathing at one time was sighing, and he had apparently, about the same time, a slight convulsion. There was tremor of the extremities during the operation. At no time was he deeply anæsthetized. Shortly after the close of the operation I left the child in its crib, in charge of a competent nurse and the mother. He was slightly pallid, but no more so than one would expect after an operation, and there was nothing in the respiration or pulse to cause anxiety. Dr. Taylor did not leave the house till an hour after the operation, when the child's pulse and respiration were entirely satisfactory. An hour and a quarter after the close of the operation, the child gave a few gasps and died instantly, presumably from heart failure. It had not recovered consciousness after the operation. No post-mortem examination could be obtained, in spite of the most earnest efforts.

Case 4 (Gerster and Sachs).—A. F., female, aged $4\frac{1}{2}$ years; labor normal, first child; began to walk after the age of 2 years; in third year began to speak a few words, but these she would use properly. When 13 months old had measles. At 15 months two distinct convulsive attacks, without paralysis. Other convulsive attacks at the age of 22 months and 29 months; none since. After these attacks grew more idiotic; lost what little speech she had, became unruly, fretful and ill-tempered; slept little. The fontanelles had disappeared. The measurements taken on shaved head were: Circumference, 31 cm.; fronto-occipital, from root of nose over top of head to occipital prominence, 30 cm.; biauricular, $32\frac{1}{4}$ cm. The child was operated under chloroform, the period of anæsthesia lasting not more than fifty minutes; linear craniotomy was done on the left side, from in front of the position of the coronal suture and beyond the lambdoidal suture. The opening in the skull was semicircular. The child's pulse was weak as soon as chloroform began to act; recovered nicely, however. Soon after operation was conscious, and pulse rallied. Without further accident child died suddenly, three and a half hours after operation, from acute anæmia.

Case 5.—In the *New York Med. Record*, February 21, 1891, Dr. John A. Wyeth reports a case of a male child, 11 months old, operated on by a median incision of the scalp from the nose to the occiput. Two lateral trenches, $\frac{1}{4}$ of an inch wide and $\frac{3}{4}$ of an inch apart, were made from just above the eyes to the occipital protuberance.

At each end a transverse cut was made in the bone on each side, and a similar transverse cut on each side at the middle. By the fingers these four bone flaps were then forcibly torn loose from the dura mater, widening the trenches from $\frac{1}{4}$ of an inch to 1 inch each. No injury seems to have been done to the dura. Time required, an hour and a half. Wound well without incident in ten days. A month later the improvement was "surprising and gratifying." The intelligence had greatly increased.

Cases 6 and 7.—Two cases reported by Lannelongue in *L'Union Médicale*, July 8, 1890, and of which a *résumé* appears in my clinical lecture in *The Medical News* of November 29, 1890.

Case 8 (Dr. J. C. McClintock's case).—A girl, aged 3 years and eight months, although appearing to be not over one year of age. Premature birth at eight months; no instruments. Anterior fontanelle closed very early. Totally blind; not the faintest signs of intelligence. Two years ago the orbital plate of the frontal bone on the right side gave way, displacing the right eyeball from the orbit. The knee joint became very painful a few months ago, and the arms and lower limbs contracted. Right tibia and fibula and left femur curved. Head narrow, forehead low. Linear craniotomy (March 28, 1891), on each side of the longitudinal sinus, with lateral grooves at the two ends. The tips of the fingers were then passed into the grooves, and the bones spread on each side until the quarter-inch grooves became an inch wide. The dura was not opened. Next morning the temperature was 103° , with rapid pulse, but soon subsided to normal. Entire union at the end of a week. The time is too brief as yet to judge of the result, but Dr. McClintock reports that the mother says that "since the operation the child is not so restless, does not cry nearly so much, and has required much less care and attention. The extremities are not so tender, and the child will try to play with any little article that is given to it." Before the operation she could only lie on one side; now she will lie on either side. The paralysis has almost disappeared, so that the left hand is used almost as readily as the right.

In considering these cases one is struck by the fact that two of them were followed by speedy fatal results. I presume it is only to be expected that children of such feeble cerebral development accompanied as in my own case (Case 3), with faulty circulation, should be less rugged and less able to stand the shock of an operation. The cause of death in my own case was very clearly, I think, heart-failure, and in Sach's and Gerster's case it was acute anæmia. This mortality, which is quite unusual of course in ordinary brain operations, should induce us to state the risk to the parents in stronger terms than we would were it an ordinary case of trephining.

For myself I cannot but think it a very fortunate thing, for if such children cannot be helped it seems to me that death is preferable rather than to linger in this world in such defective and helpless condition.

It should, however, make us especially careful as to the administration of the anæsthetic and we should use all possible means to shorten the operation as much as possible. The forceps I devised for the operation certainly answer the purpose very much better than those I first used, so that the time required for the last operation was only twenty minutes, instead of an hour and a quarter as in my first. In using them it is better to cut alternately a little to the right and left (as one turns his toes out in walking) to prevent their binding. It will be noticed that the upper blade is perforated. This perforation widens from the cutting edge upward, so that each piece of bone bitten out pushes its predecessor loose. In a recent case of spinal laminectomy I used the same forceps to remove the vertebral laminæ, and I found them far superior to any of the other instruments I had on hand, and tried in turn.

I have not yet operated on both sides of the skull, and in view of our present experience I certainly would deprecate a simultaneous operation on both sides. Probably the additional shock would be very unwise and would add greatly to the mortality. Whether two lateral operations done successively will improve the condition of such children more than one remains to be seen. The results as to mental condition in the six cases that have survived may be stated briefly as follows: Lannelongue's second case was reported almost immediately, too early to judge of any results. So too of McClintock's case. In the other four children there can be no question of improvement, very rapid in Lannelongue's case, slower but sure in both of my own and in Wyeth's case. We have, therefore, I think, sufficient reason to encourage us to operate in other cases, and it is this fact, and the fatal result in two, which has led me to report my cases so early, before the final results are obtained. This will require several years, and meantime we ought to make known the immediate results as a guide in other cases.

In the *St. Louis Clinique of Physicians and Surgeons*, April and May, 1890, Dr. Louis Bauer reports the case of a young woman on whom he did a craniotomy for microcephalus. Her age, the measurements of the head and the date of the operation, are not given. Two buttons were removed from the right parietal bone, and the intervening bridge chiseled away. On May 9, presumably 1890, a second operation was performed, on the opposite side of the skull. Prior to the operation there was spastic paresis of the muscles with great tremor, which after the first operation had so diminished as to enable the patient to

thread a needle. There is no statement as to mental condition. She recovered from the second operation, but it is too early to judge definitely of results.

In *The Medical News* of January 3, 1891, Dr. Trimble, of Baltimore, reports the case of a child, 3 years of age, whom he trephined on November 8, 1890. On the right side of the middle line two buttons of bone, 1 inch in diameter and $\frac{1}{2}$ inch apart, were removed, so that the opening measured $2\frac{1}{2}$ by 1 inch. Some improvement was noted on December 6, 1890.

I have not included these cases under the head of linear craniotomy, since it seems to me that they should be considered simply cases of trephining for microcephalus and idiocy, as has previously been done by Fuller and others. The essential difference between trephining and linear craniotomy is this: that in linear craniotomy the intention is to make the entire side of the head a *bony flap*, as it were, whereas the trephining in the cases alluded to simply removed two buttons of bone and the intervening bridge, and so produced a difference in pressure and possibly allowed, simply at the point of trephining, a little bulging of the brain itself. As to the results, so far as the brief time in all the cases will allow us to judge, they seem to be quite as good after trephining as after linear craniotomy proper, and if so, it may be a matter of indifference which is done. But at the present time it seems to me more logical to do the craniotomy than the simple trephining.

The operation of Wyeth seems to me unwise, and likely to be followed by a fatal result in more cases than if the less heroic method usually employed is followed. Even this has resulted in two deaths already, and if a double operation is done and the two sides of the cranium are forcibly separated, the danger would seem to be far greater. The dura might easily be torn, especially as it is so adherent in children. Moreover, the brain cannot suddenly follow the widening bone, but must be persuaded, as it were, to occupy a larger room by favoring its gradual growth. This, I think, is better obtained by the process I have followed than by Wyeth's method. The same remarks apply to McClintock's case.

A SYSTEM TO DEFRAUD INSURANCE COMPANIES.—There is said to be a gang in Paris, the members of which thrive at the expense of the insurance companies. Their plans are simple. A man lets himself be run over. The driver is his accomplice. The authorities are appealed to. An insurance inspector reports on the case, making the slight injury sustained appear a very serious one. The profits are divided up. As occurrences like this became frequent, suspicion began to be aroused. The result ended in the imprisonment of sixty-five members of the gang.

DISLOCATIONS, UPWARDS AND BACKWARDS, OF THE SCAPULAR END OF THE CLAVICLE.

Read in the Section of Surgery and Anatomy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5, 1891.

BY WM. H. DOUGHTY, M.D.,
OF AUGUSTA, GA.

In the July No. of the *Richmond and Louisville Medical Journal* (now *Gaillard's Medical Journal*), for 1876, I published an article entitled:

"True Method of Treating Dislocations, upwards and backwards, of the Scapular end of the Clavicle, with report of a case illustrating the principle employed."

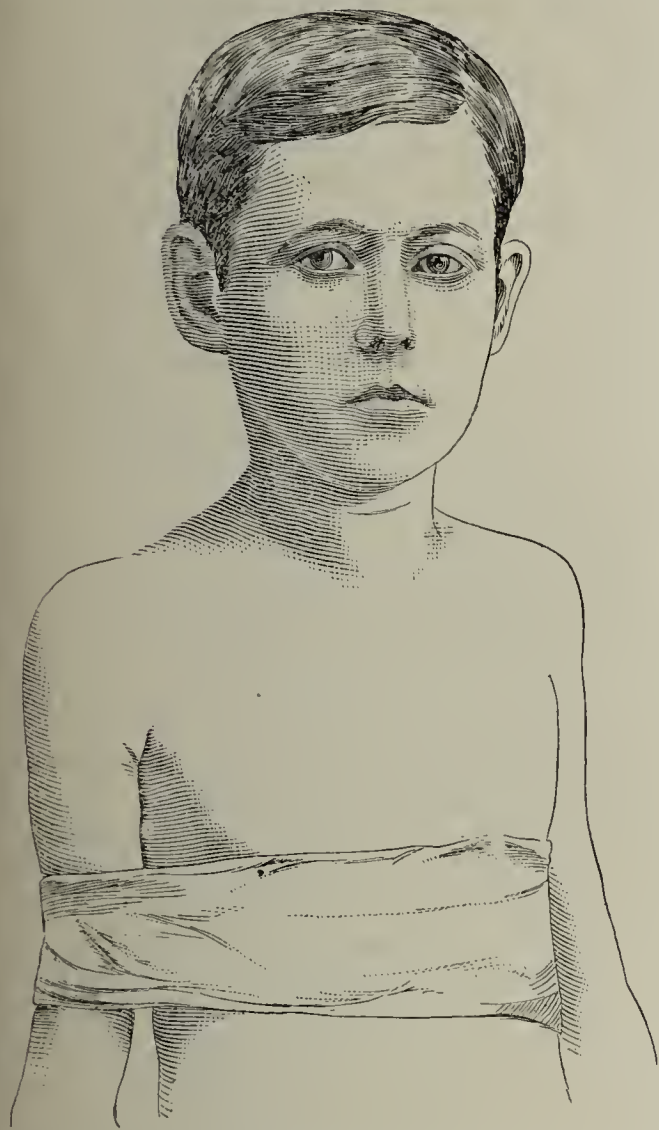
According to standard authorities such injuries are rare and their treatment extremely unsatisfactory. Since 1876 I have seen but two cases, both of which occurred within a few months of each other in 1888: one in my own practice, report of which accompanies this paper; the other in that of my friend and neighbor, Prof. Thos. R. Wright, of this city, through whose courtesy I am permitted to refer to it, and report an excellent result from the method of treatment given herein.

My first case was published in illustration of a new principle in the management of such injuries, and it was thought that the simplicity of the treatment and its satisfactory result would at least claim the attention of the surgeons, if not their approval of the principal then first enunciated. I am, however, not aware of its employment, or even recognition by others, a fact that induces me to present it before this body on this occasion, with two additional cases, perfect in their results, to support its claims to confidence and adoption. Hamilton, in sixth American edition of his great work on "Fractures and Dislocations," Wyeth, Ashhurst (*Encyclopædia of Surgery*), still detail the old imperfect methods.

The wood-cut given with the first case was intended to show the position of the arm, mode of dressing for maintaining this, and the permanent reduction and retention of the displaced end of the bone. It was a poor "cut," a libel on an excellent photograph from which it was made, taken soon after the dressings were applied. The photograph accompanying the present report shows the *result*, having been taken six weeks after the injury; the loose worn bandage bespeaks its own superfluity, having been used longer than was actually necessary to prevent the premature use of the arm by a thoughtless youth. As to the permanency of this result, I may report that an examination of the parts in March, 1891, nearly three years after treatment, revealed an altogether satisfactory condition. I wish also to state that a similar examination of my first case after the lapse of twelve years

showed a reproduction of the displacement, although at the time of discharge of the case it was fully restored as then reported. This fact suggests the necessity of restraining the early, free use of the limb with laboring men as an additional protection against the return of the luxation. The acromio-clavicular articulation is perhaps one of the weakest in the body, surgically speaking, and may need therefore greater attention in this particular, especially with adults, subjects of injury.

Of the three cases now reported under this method of treatment two give unquestioned

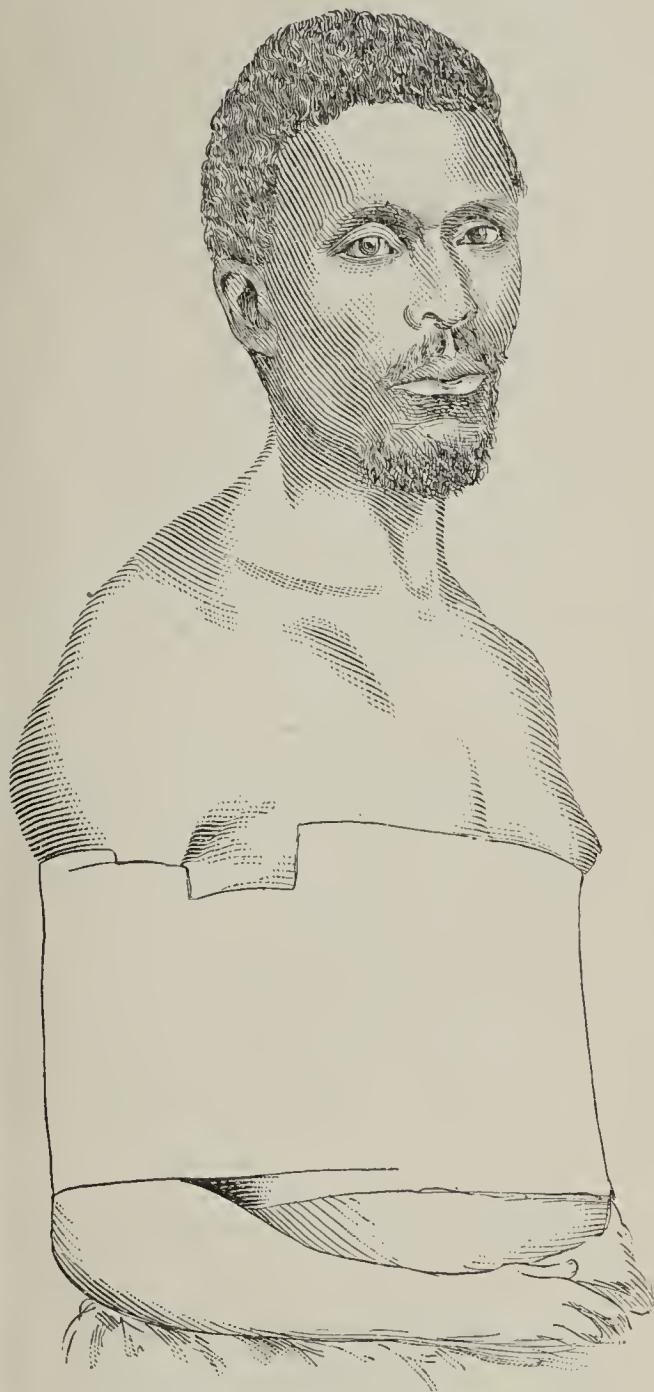


Injured June 1st, 1888. Photographed July 13th, 1888 (6 weeks), when bandage was removed. Illustrates result.

satisfactory and permanent results, while under former methods the latter were so rare that Hamilton says: "my notes furnish only *two* cases of perfect retention after a complete dislocation at this point" (p. 566), having recorded forty-one cases in all.

For the benefit of those who may not have read the former article on this subject (copy of which is enclosed herewith), the principle referred to, briefly stated, is as follows: *In lieu of direct pressure on the displaced end of the clavicle, made by pads, straps, bandages and other similar devices for retaining the same in position, it is suggested to draw the arm forcibly downwards and*

backwards against the side of the chest, thus stretching to the utmost the fibres of the deltoid arising from the outer third of the clavicle, and antagonizing the trapezius whose vigorous action maintains the displacement; and further, rotating and fixing the scapula by drawing upon its attachments (muscular and otherwise), to the humerus. The arm is then secured firmly and immovably by wide strips of adhesive plaster encircling the body and arm.



Illustrates position of arm, mode of dressing for maintaining permanent induction, etc.

It is not necessary to encircle the arm first (see photograph of first case) and then the body and arm together, as there is liability when this is done to great tumefaction of the forearm and hand, as my second case developed.

A little reflection will satisfy the thoughtful that there is gained by this mode of management, as nearly as possible, the immobility of the scapula, the requisite antagonism of the trapezius by the deltoid, with the consequent replacement and retention of the displaced bone.

All of the structures about the shoulder-joint, thus drawn upon, aided by the substantial leverage of the humerus when pressed upon the side of the body, sustain the deltoid and contribute to the result. Moreover, the rotation of the scapula rather relaxes the fibres of the trapezius inserted into the spine of the scapula, while those of the deltoid arising therefrom are pulled upon. The position of the end of the clavicle, no longer free to move, is the mathematical resultant of the operation of these opposing forces, now equally balanced.

Thus, quoting from my former article, "by this simple mechanism was beautifully illustrated that cardinal principle in the surgery of dislocations, namely, that their safe and proper reduction and treatment can best be secured by a careful study of the muscular action that maintains the displacement (a factor in its production also), and the relations of the muscles that normally antagonize it." (P. 4).

By this plan of permanent adjustment the shoulder is left open to inspection at all times, and the bungling, irksome apparatus of every kind, heretofore employed, is dispensed with.

Report of Case.—On June 1, 1888, Herbert C., about 14 years old, was thrown from a road-cart, violently striking the right shoulder; was immediately disabled thereby, and complained of great pain in the shoulder and inability to move the arm.

An examination showed, besides a contusion of the soft parts about the shoulder, a dislocation upwards and backwards of the scapular end of the clavicle. The extent of the luxation was sufficient to produce a bulging of the fibres of the trapezius, very distinct, when viewed from all directions. Dislocation was easily reduced and bone maintained in position by method detailed elsewhere. Result was entirely satisfactory as will be shown by accompanying photograph taken on July 13, six weeks afterward.

SUGGESTIONS ABOUT ABDOMINAL AND PELVIC SURGERY.

Read in the Section of Obstetrics and Diseases of Women at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY WM. H. WATHEN, M.D.,

OF LOUISVILLE,

PROFESSOR OF ABDOMINAL SURGERY AND GYNECOLOGY, KENTUCKY SCHOOL OF MEDICINE, ETC.

The recent contributions upon abdominal and pelvic surgery are probably more numerous and practical than upon any other department of general or special surgery; still, there is a variety of opinion as to the best methods of treating pathological conditions within the peritoneum, or as to the immediate or permanent results of the many procedures that have been practiced.

This is especially true of pelvic surgery, where we find, in the practice of the most experienced and successful operators, accidents during the operation and complications following it, for the prevention of which, there is no united opinion as to the correct technique to adopt; nor is it always possible to explain why troublesome complications occur in one case, and do not occur in another apparently similar case. Careful observation and experience may finally teach us much wisdom in these matters, and I will ask your kind indulgence while I briefly allude to a few things that may be of value, if carefully discussed by the members.

There is too much laparotomy done and too many men are doing it; men who know too little about the diagnosis and pathology of abdominal or pelvic diseases, or about the best technique in operating, and have few facilities for doing such work. Continuously good laparotomy work cannot be done except by men who largely devote themselves to this department of special surgery, and with such men some cases are operated on where the indications do not justify it. The appendages are sometimes removed for vague nervous troubles, where there is no disease of the ovaries or tubes, or peritoneal adhesions. Such cases are made worse, and are mutilated in a way that cannot be corrected.

The pendulum has swung too far, but many of our best operators are earnestly urging upon the medical profession that the operation is not indicated except in cases where there is well defined disease that has resisted, or will resist, other more conservative means.

As the experience of an honest surgeon widens, he operates relatively less frequently, and he can recall cases that he does not believe should have been operated on. An honest, intelligent and careful man may, when young in observation and practice, make mistakes in the selection of suitable cases for laparotomy, but this is less frequent than it was a few years ago. It is criminal to do dangerous or capital operations while ignorant of the best methods of doing such work, or for the purpose of adding a little cheap glory to our reputation; or to report cases that apparently recover from the immediate effects of the operation as permanently relieved before the final results can be appreciated. Such men usually have many bad results or deaths that they do not report so promptly, and the profession, or the people, seldom hear much about them.

I have reported but a small minority of my successful cases, but have promptly reported my bad results or deaths, because by a careful study of such cases, we finally do better work, by learning how to avoid or prevent complications or accidents that may cause the death of our patient. Reported recoveries in simple cases of laparotomy do not always indicate superior or unusual skill in

the operator; and such reports are of little value to the medical profession, and may indirectly result in the death of many women, by influencing ignorant men, with no facilities for such work, to attempt it because of its apparent simplicity.

What I may say relative to the technique, etc., of laparotomy, refers to cases where the conditions are manifestly such as to positively indicate the necessity for the operation. In preparing for an operation, the physical and mental condition, and the hygienic and sanitary surroundings of the patient, should be made as perfect as possible under existing circumstances; and unless absolute surgical cleanliness is observed in everything that may come in contact with the wound or peritoneum, septic infection may follow.

Some operators, who talk a good deal about antisepsis, do not know how to be surgically clean, because they have not learned to appreciate the value of cleanliness in every detail before and during the operation. The infection often comes to the patient by the neglect of little things, without the strict observance of which no one can be a successful abdominal surgeon. The danger from atmospheric infection is practically *nil*, as has been shown by experiments, and by the continuously good results of operations done in large amphitheatres before several hundred students. It may be possible for septic matter to reach the peritoneum through the intestinal walls, but this has not been proven. A spray of antiseptic solutions is not necessary, and if strong enough to kill pathogenic germs supposed to be floating in the atmosphere, it is positively poisonous.

Some men who use the spray Don Quixote-like, while pursuing an imaginary foe allow the deadly enemy to enter through numerous neglected channels—the hands, sponges, sutures, instruments, etc. Every operator should of course observe the broad principles that make the foundation of all good surgery, but if he neglects the details, he will be disappointed in the results. Asepsis is more easily accomplished in well regulated private or public hospitals or infirmaries; in private houses septic matter may more readily be introduced unless the operator, or an experienced nurse, rigorously superintends everything before and during the operation.

That we may better appreciate the practical significance of my position as to what constitutes asepsis in laparotomy, I will give some of the methods before and during an operation. I prefer not to operate in a room where the patient is afterward to stay, and when I am compelled to do so, if delay is admissible, I have the room thoroughly cleansed and ventilated for twenty-four hours before the operation, but use no spray or other means of disinfection. When it can be done, I operate in a specially prepared laparotomy room at St. Joseph's Infirmary, so

arranged that everything in or about the apartment can be kept aseptic with but little care. The operating tables for the surgeon and nurses have plate glass covers, and the trays for instruments and pans for sponges and dressings are white porcelain lined.

Everything is carefully cleansed before each operation, and the operator and his chief assistant take a bath and put on clean linen, and white aprons reaching from the neck to below the knees and extending entirely around the body, so as to prevent the hands coming in contact with anything unclean. The towels are carefully washed and boiled, and are used for no other purposes. Soft and well-shaped sponges, free of sand or grit, are selected, and after being carefully washed, are made aseptic after the method of Greig Smith: Eight ounces of bisulphide of soda and four ounces of oxalic acid are dissolved in a gallon of water, in which twelve to twenty sponges are immediately immersed and kept for ten minutes; they are then washed by frequent changes of water for one hour, so as to get out all the sulphurous acid and sulphur. This is quite a labor, but it insures perfect freedom of septic matter. They are then wrung out of the water and put into a clean cotton or linen bag so as to keep out the dust while drying. When dry, they are put in large ground-glass-stoppered bottles or jars, and may be kept indefinitely in a pure condition.

Sponges once used may again be made aseptic by the same process, but I prefer not using them a second time if they have been soiled in septic matter. If a sponge comes in contact with anything that may be unclean, it is not used until again prepared. Chinese hard-twist silk of three sizes is used. It is purchased in unbroken packages, and wound loosely on separate glass spools. These are put into glass test tubes, which are stoppered with a piece of absorbent cotton and then sterilized. They are kept in the sterilizer for an hour, for three consecutive days. The silk is now so free of bacteria that a culture could not be made from it, and if the cotton is not removed it will stay in this condition. Each tube contains enough silk for a laparotomy. The silk and needles are kept during the operation in sterilized water at a temperature of 212° . This may not be necessary, but if the cotton has been partially displaced from the tube, it would be a wise precaution.

In the same boiling water I keep the small glass drainage and the large irrigation tubes. As our hydrant water is generally muddy, I use sterilized water, and always have it boiled before operating in vessels kept for this special purpose. The instruments are washed with sapolio or some strong soap, and boiling water is poured over them. When I begin the operation, the hairs of the brush are pushed through the eyes of the

needles and the holes in the instruments so as to get away all poisonous matter. It is well to have instruments, towels, dressings, etc., sterilized for an hour before using them, but they should be thoroughly washed before sterilization.

The patient is given one or more hot baths by a well trained nurse, the vagina and rectum are washed with copious injections of hot water, and the pubes is shaved. Before making the abdominal incision, the abdomen is again washed with soap and brush, and wiped off with sulphuric ether. Dry towels covered by towels wrung out of boiling water are placed over the abdomen to prevent anything possibly unclean coming in contact with the hands or any of the appliances used.

The nurses in charge of the sponges, needles and sutures are as aseptic as the operator. I use no antiseptic solutions, but use for sponges, instruments and hands boiled sterilized water kept as hot as can be borne. If everything is aseptic we don't need antiseptics, and they may cause general or local trouble. I will refer to but a few points in the technique of the operation. Adhesions are carefully separated close to the tumor or structure to be removed, or the uterus, to prevent hæmorrhage or wounding the intestines or bladder. Adherent intestines should be separated if possible; otherwise the operation is incomplete, and the patient will not probably be permanently, if at all, relieved.

The patients sometimes suffer more after the operation than before it, because of the extensive adhesions induced by uncleanness, antiseptics or traumatism committed by a careless operator. I believe adhesions will be fewer if antiseptics are absolutely excluded from the operating room, and are not even used for the instruments or the hands. This may seem heterodoxical to many, but I have arrived at this conclusion, after experience and careful observation. If the instruments and the hands are clean, we need no antiseptics, and if they are unclean, the solution will not cleanse them or prevent infection, but may so irritate the peritoneum as to cause few or many adhesions. It will require more experience to decide how much damage is done in this way. Blood, pus and all foreign matter should be removed, and great care should be practiced to prevent rupturing a pus sack or cavity in an operation for their removal.

When any foreign matter except blood has gotten into the cavity, it should be thoroughly irrigated by hot sterilized water. This is not only the best way to cleanse the peritoneum, but it is also an excellent means of preventing or treating shock. This may be done by attaching one end of a three-foot piece of gum hose to a glass tube, and the other end to an iron granite funnel, into which water is copiously poured and forced by hydraulic pressure through all parts of the abdomen and pelvis.

The drainage tube is invaluable in many cases, but if improperly used it is capable of doing much mischief. There are many cases in which it is indicated; there are many in which it is not. It should be used if we close the abdomen before hæmorrhage has ceased, or if foreign matter, that is possibly septic, has got into the abdomen. It should be attentively cared for and frequently emptied with a long nozzle syringe by a well-trained nurse. It should be very small and light, with open end, and numerous fine openings on the sides. It should be carefully placed, and long enough to enter to the deepest part of the pelvis.

After the dressings are applied around the tube, a twelve-inch square piece of gum dam, with a small hole cut in the center, should be closely fitted around the neck, so as to keep the dressings clean. If a piece of absorbent cotton is kept over the mouth of the tube, and held in position by folding over the gum cloth, it will absorb discharges and remove the danger of sepsis from the introduction of pathogenic germs. It should be removed when soiled and a new piece used.

Some of our best known laparotomists use two long drainage tubes, and do not protect the dressings and the wound by the gum dam. A small tube will usually drain as well as a large one, and it does not subject the patient to so many dangers.

While it has been shown by Grawitz that the peritoneum may render harmless, and dispose of cystic fluids, pus, or pathogenic germs, it would be reckless to expect it to do so when we may supplement the efforts of nature by the use of a drainage tube, through which irrigation may be used if needed. The long nozzle syringe, or a syringe with a small gum tubing attached, affords the best means of emptying the tube, and this can be done aseptically. The practice of trying to drain the peritoneal cavity by introducing strips of gauze or wick into the tube to its bottom, or allowing shreds to enter the cavity, as practiced by German laparotomists, is bad surgery, but may be a means of introducing septic matter. While aseptic gauze may usually drain efficiently, it sometimes prevents drainage and causes the blood to coagulate in the tube. This is especially true where capillary drainage is attempted by the use of the wick. I have never seen the slightest tendency to coagulation where the syringe was used. Probably the most correct exposition of the methods of drainage in Germany will be found in the paper "Drainage in Laparotomy," by Sanger, of Leipzig, at the recent meeting of the Tenth International Medical Congress at Berlin. No mention is made of protecting the dressings from the discharges by the use of gum dam, or of removing the secretions by suction with the syringe.

Vaginal drainage, with possibly a few exceptions, should never be attempted, though Dr. August Martin, of Berlin, and other German operators, frequently practice it. It can accomplish nothing more than supra-pubic drainage, and subjects the patient to greater dangers from sepsis. The tube should be removed as soon as the conditions will admit, and when bleeding has practically ceased, and there is only a small quantity of clear inodorous liquid removed, it is no longer needed. If the tube has to be retained more than forty-eight hours, it should be rotated a little twice daily, so as to facilitate drainage by preventing obstruction in the small openings.

The dressings need not be disturbed to remove the tube, and in a few weeks the place where it was introduced can scarcely be detected; and ventral hernia will not occur at this point more easily than at any other part of the incision. Hernia will seldom occur if we are careful to unite the ends of the abdominal fascia. This may be done by the deep suture if the fascia is drawn out and the needle correctly introduced, but the separate suturing of the fascia is more reliable.

Recognizing the fact that in laparotomy work death is too often caused by septic infection, and that this can nearly always be prevented, I am deeply in earnest in my desire to aid in impressing upon the medical profession what I conceive to be the best means of preventing the introduction of septic matter. As death occasionally follows prolonged anæsthesia in organic disease of the heart, lungs or kidneys, we should carefully examine these organs before we decide to operate.

AXIS TRACTION AND A COMBINED AXIS TRACTION FORCEPS; ALSO AN ANTI-CRANIOTOMY FORCEPS, TO BE USED AS A SUBSTITUTE FOR CRANIOTOMY AND VERSION IN PELVIC DEFORMITIES.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 1891.

BY T. J. MCGILLICUDDY, M.D.,

INSTRUCTOR IN OBSTETRICS AT THE NEW YORK POLYCLINIC; OBSTETRICIAN TO THE NEW YORK MOTHER'S HOME MATERNITY HOSPITAL; SURGEON IN CHARGE OF THE YORKVILLE DISPENSARY AND HOSPITAL FOR WOMEN AND CHILDREN, ETC.

The correctness of the principle of axis traction is now, of course, conceded by all, but there are still many fallacious ideas in connection with its production. One of the most common is, that it is necessary to have rods attached to the blade by a movable joint, and this idea has been followed by about all the imitators of Tarnier's models. Another is that the traction, whether

with tapes or rods, must in no way be connected with the handles, which must move freely in all directions, and still another is that rotation and flexion of the head can only take place when Tarnier's instrument or others similar to it are used. Tarnier's instrument, when clamped to the infant's head, interferes with rotation. These ideas I believe are detrimental to proper axis traction, as it is well known that, in the skilful use of the forceps, we should frequently unlock the blades that the head may undergo rotation and accommodate itself to the pelvic canal.

Pajot, Hubert, Morales and Albert H. Smith, all recognize that axis traction can be made without any such complicated attachments to the ordinary forceps.

With the following instrument, which was described in the *American Journal of Obstetrics* for December, 1889, we can make ideal axis traction during the entire passage of the foetal head with remarkable ease and safety. In cases where much strength must be employed, you cannot perform axis traction properly with the common forceps by Pajot's, Smith's, or any other manœuvre.

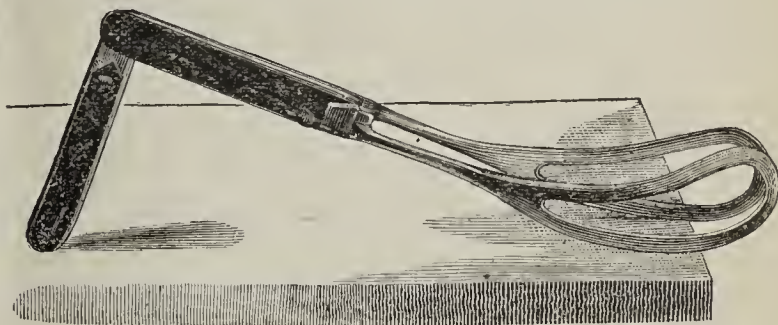


FIGURE 1.



FIGURE 2.

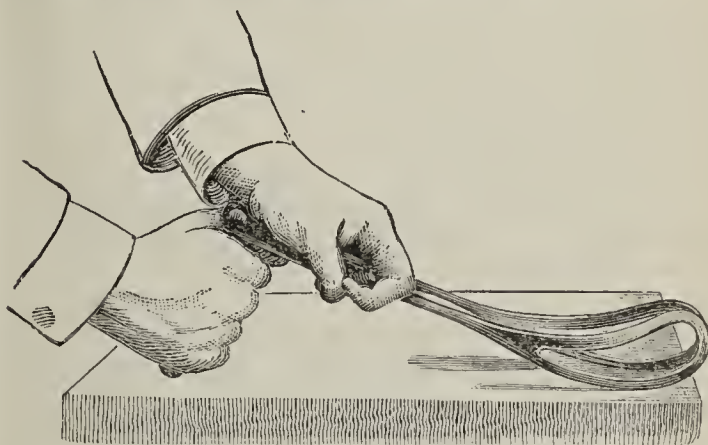


FIGURE 3.—Method of holding the forceps.

The advantages claimed for this instrument are:

1. That with its use axis traction is simple and uncomplicated.
2. That it is superior to Tarnier's in the fact that while using it, axis traction at the superior strait is perfect.
3. That while, in relation to Tarnier's instru-

ment, a great deal has been said of the indicator, in this forceps the indicator is in the hands of the operator, and tells his *conscience musculaire* the direction of traction, as well as the resistance.

4. That it does away with the trouble of Pajot's, Smith's, or other methods, and in its use one has plenty of power and perfect control.

5. That it is easier to make rotation in the posterior positions with the adjunct handles, if it is thought best to use the forceps for that purpose.

6. That it is easy of application, and in its dual character, it has all the advantages of axis traction and the ordinary forceps, and saves the expense of buying two instruments where one will do.

The Tarnier instrument is complicated, cumbersome and expensive, thus nullifying its good points, and has been condemned by the Paris Obstetrical and Gynecological Society for these reasons.

W. Robb to see with him a little girl of 3 years, who had several hours before fallen three stories in a hallway and, striking the tiled floor, fractured her skull. The line of fracture running from the mastoid region over the vertex to the other side, and the occipital portion was driven by the blow under the other part over half an inch, compressing the cranial contents to at least that extent. After prying the occiput back into position, the parts were treated antiseptically, and the patient made a rapid and complete recovery. The whole upper segment of the infantile brain, including the biparietal and bitemporal portions, is relatively its non-vital part, and will stand very considerable compression without danger, while the bimastoid or basal region is the vital portion, which Nature has so wisely protected by making it incompressible. I think it is conceded that the death of the infant is generally caused, where the ordinary cephalotribe is

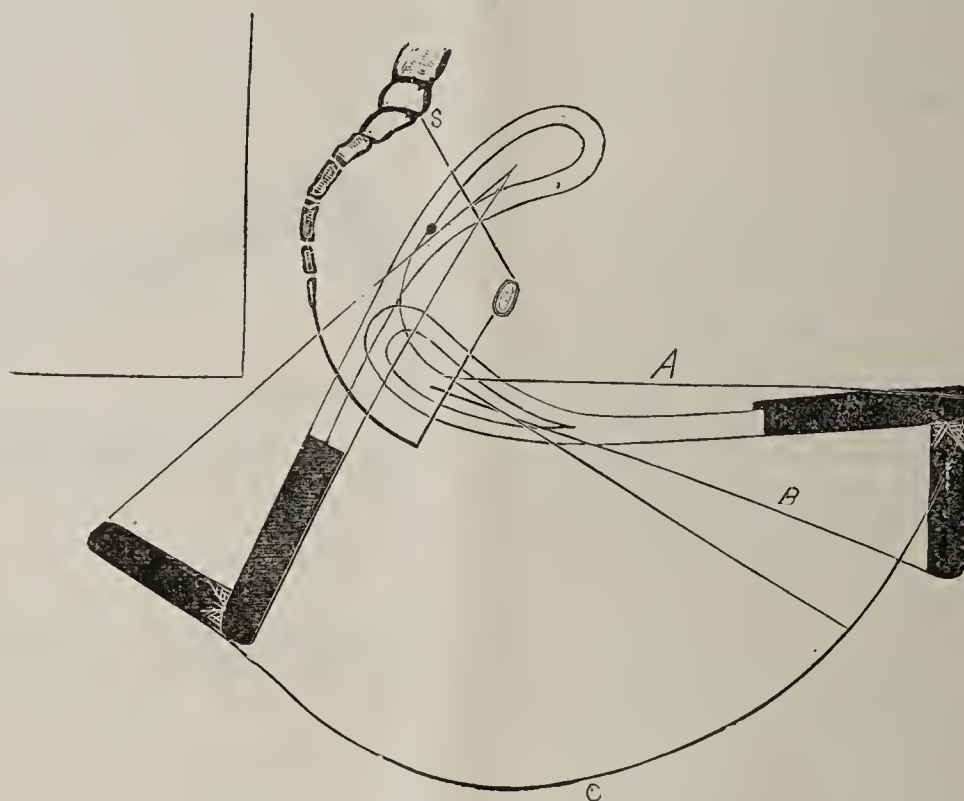
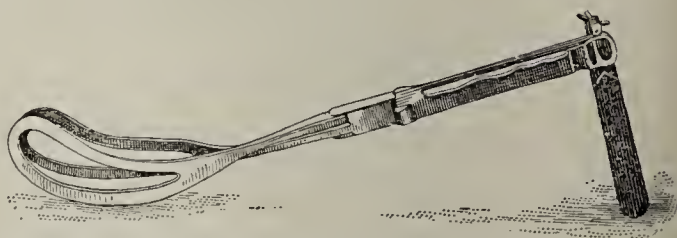


FIGURE 4.—Axis traction. (Modified from Charpentier.)



The forceps has an undoubted place as a compressor in certain cases. We are at all times to follow Nature's guidance. Who has not seen a foetal cranium elongated an inch more or less, and generally distorted, by the moulding to which it has been subjected in its passage through the pelvis, and yet no damage has been done to the cranial contents. The following case will exemplify the amount of compression the brain will sometimes stand even in children:

About two years ago, I was asked by Dr. S.



used, by the close approximation of the tips, thus fracturing this part and causing pressure on the medulla. Many cases are recorded of depressions, indentations, and even fractures of the arch of the infantile cranium, with rapid and complete recovery. Therefore, as some compression of the infant's head is compatible with its safety, and as there is no modern instrument that I am aware of, that stands between the ordinary forceps and

the cephalotribe or cranioclast, there can be no doubt of the utility of this, which is intended as a substitute for delivery by craniotomy or version in cases of pelvic contraction of minor degree, or where the common forceps is unsuccessful. It is an effectual tractor, and as the blades are sufficiently strong to prevent feathering, there will be no slipping. It makes moderate transient compression of the flexible infantile cranium in its upper portion, while it does not press too strongly on the child's neck with its tips. Thus it gives the child a chance for its life while it minimizes the risk to the mother. It is safer for the mother than craniotomy, because it terminates the labor more speedily, and there are also no cutting instruments to slip, and no spiculæ of bone projecting to tear the maternal parts. It is also quicker and better than turning, as transient compression of the flexible foetal skull by the forceps is no more dangerous than compression by the contracted pelvis in version, and traction by the forceps is much less dangerous than traction by the lower extremities, which frequently disjoints the neck, compresses the funis and even decapitates. We must not alone look to the safety of the mother, but we must also have some regard for the safety of the infant. Turning may be better, in skilful hands, than leaving all these cases to nature, and it is an excellent substitute for craniotomy, because if you cannot get the head out, the compression on the cord kills the child, and perforation is then justifiable. With this forceps I believe we have something superior to either.

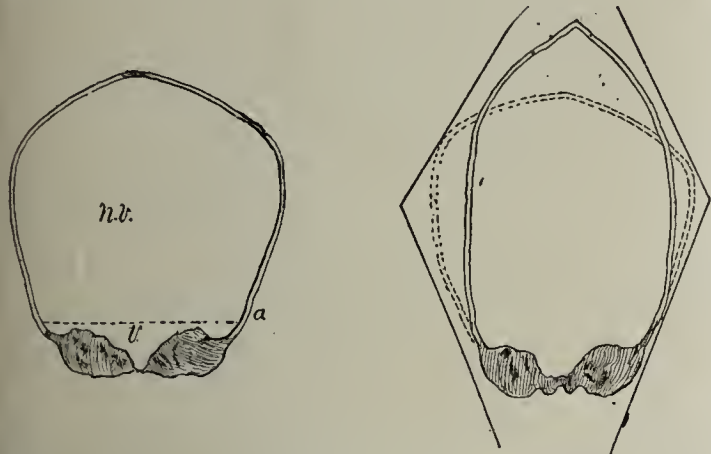


FIG. 5.—Illustrating the effect of lateral compression upon the sides of the cranium after the use of the forceps, after moulding and after turning. Showing also its double conical form, or rather its olive-shaped form.

The argument of Simpson that after turning, the bitemporal diameter is an apex to the cone-shaped head, and the biparietal diameter the base, and delivery is consequently easier, may be true when the forceps are not used; but the application of the forceps changes all this, and makes the bitemporal diameter the base of the cone, when it compresses the biparietal portion (Fig. 5). He believes "that the necessary degree of compressions would be effected more easily and by a less amount of force if the head

were drawn through the narrow pelvis as a footling presentation than if it were driven into it as a cephalic presentation." I am sure that with the use of this compressing and traction forceps, and from the character of the cranial bones, that not only will no more force be required, but there will be greater safety for the infant. The question is, whether the uterine force, acting on the breech, plus the traction on the forceps, is greater than the uterine force acting on the head, plus the traction on the body, and with which we are justified in using the greater force.

Simpson's Conclusions in Favor of Turning are:

1. The foetal head has the shape of a cone with the base upward, and when the trunk is delivered, the smaller part of this cone may usually engage in the superior strait.
2. The solid hold given by the body of the foetus when it is delivered first allows us to use force enough to cause compression of the head, and to bring, if need be, the elastic and larger part of the cone into the greatest space in the contracted pelvis.
3. The head, drawn through the contracted pelvis, generally so adapts itself, or may be caused to adapt itself, in such a manner as to bring its smallest diameter, the bitemporal, instead of the biparietal, into the most contracted diameter of the pelvic strait.
4. The cranial vault is more readily compressed when the force is applied to the lateral surfaces, as it is in the case of the after-coming head, and not as in the case of the before-coming head, partly to its lateral and partly to its superior surfaces.

In justifying these theories he arrives at the following conclusions:

1. The duration and hence the danger of labor is diminished by version. Therefore version should be resorted to as soon as dilatation is complete, without waiting for engagement of the head and in consequence before inertia can set in.
2. Compression of the foetal head is compatible with its life.
3. The traction to which the foetal neck is subjected is not incompatible with foetal life.
4. The risk of death from compression of the cord is not great enough to cause rejection of version.
5. Energetic but rapid compression is less dangerous to mother and to infant than less but prolonged compression.
6. Local lesions of vagina, fistulae, etc., are more likely to result from forceps than from version.
7. The risk of rupture of the uterus during version has been exaggerated.

Conclusions in Favor of the Anti-Craniotomy Forceps.

1. The foetal head, after moulding or application of the forceps, has the shape of two cones placed base to base, and, like an olive, either end may engage in the superior strait.
2. The anti-craniotomy forceps gives a much better hold, and causes slight compression if needed.
3. The same thing occurs in cephalic presentation.
4. With moulding and application of the forceps you compress not only the lateral surfaces, but the fronto-occipital surfaces as well.

In favor of anticraniotomy forceps.

1. It is not diminished as much as when this forceps is used and it can be used, if necessary, before engagement of the head as well as after.
2. If that is true why not use the forceps?
3. The traction to which the foetal neck is subjected often kills the foetus and sometimes decapitates it.
4. There is no risk of death from compression of the cord in the use of the forceps.
5. It is the same with the forceps.
6. Local lesions generally result from impaction with delay, version, and least of all from improper use of the forceps.
7. Much more risk of rupture with version than with forceps.

No woman should be delivered except by axis traction, and with these axis traction handles you can determine the exact amount of resistance, and the proper amount of force to use, and readily and easily use it.

Dr. Leischman, in writing of the long forceps

and high operation, says: "It is now very generally believed by those who have had the greatest experience that a large proportion of the unfortunate results depend upon improper instruments, and especially upon the use of such as are deficient in power. The observations which, on this point, we have already quoted from Dr. Barnes, apply here with peculiar force. Power and control are correlative factors toward the attainment of the result which we desire, and if there is a deficiency in the former, we can have but little confidence in the issue of the case." With this forceps we pull directly in the axis of the brain. One cannot grasp the handles of the ordinary forceps with comfort with both hands and still make any great axis traction. Most physicians say that the hands become cramped and lose all their muscular power after pulling a short time.

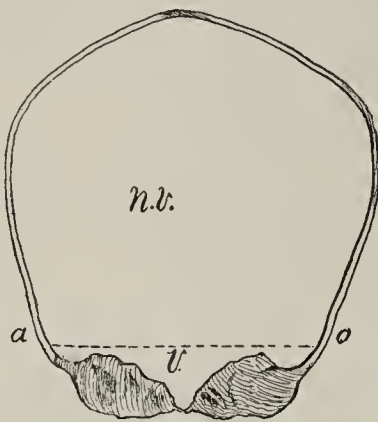


FIG. 6.—Illustrating the vital and non-vital portions of the fetal cranium, and thus showing where pressure may be made.

This instrument is not a cephalotribe or cranioclast, but a conservative, life-saving forceps, to be used in cases of considerable pelvic deformity. The following are some of its dimensions:

Length, 16 in.; length from lock to tips of blades, 9 in.; length of handles, 7 in.; length of axis of handles, 4 in.; average width of blades, $1\frac{1}{4}$ in.; greatest width between blades when closed, $2\frac{1}{2}$ in.; width of tips of blades when closed, $\frac{7}{8}$ in.

When the head is high in the pelvis the operator should make a careful estimate of the conditions present, the obstacles to be overcome, the size of the child's head, etc., even if he has to insert his hand into the uterus. We must apply the forceps to the sides of the child's head when it is possible, but we must also do it when there is room. If the instrument is properly used it will do no harm. It is shown by Winter (*American System of Obstetrics*) that the forceps, in contracted pelvis, has caused less than fifteen per cent. mortality.

Midwifery as an art, and the technique of Cæsarian section as an operation, has improved to such a degree that craniotomy on the living foetus need never be performed.

Osiander the elder, in forty years of practice, never did craniotomy. Dr. Alonzo Garcelon, in whose office I had the honor of being a student, in an active practice of over fifty years, never did the operation, and Dr. More Madden, in over

26,000 cases, never performed it, and never saw a case where it was indicated. The conclusion to which I have arrived is, that when this instrument cannot deliver a living child, there is no other operative alternative but Cæsarian section, as the revolting operation of craniotomy on the living foetus is not justifiable. It has not been an uncommon thing some years since in England for a single practitioner to report forty or fifty cases of craniotomy. The child is exactly the same in utero as it is after birth; the only change is in the surroundings; and to kill it before birth is as much a crime as to kill it after.

The instruments described are made, among others, by Mr. E. Ackerman, 153 W. 29th street, and sold at \$6 and \$8 respectively.

THREE CASES OF EPITHELIAL GRAFTING FROM THE HORNY EPIDERMIS, WITH REMARKS.

Read in the Section on Surgery and Anatomy at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY C. B. KIBLER, M.D.,
OF CORRY, PA.

Practical example is always in advance of theoretical precept, and so in this paper we will present in practical work, to demonstrate the operation, technique, material used, and clinical results in a few cases of what doubtless is a new and novel procedure in epithelial grafting. Appreciating the fact that the researches of Reverdin, first announced in 1870, of the transplanting of small particles of skin to a raw or granulating surface, and the wonderful excellent results obtained by many operators by this method since then, as well as the most admirable results obtained through the method of Thiersch and others by removing long strips of skin from the thigh or arm and applying to much the same condition of surface as that of Reverdin, has to a greater or less degree superseded the method of the former and made the raw ulcerating surface of the past a thing not to be dreaded by the surgeon of the present day, as it many times was the surgical approbrium of the last decade. There is no question of doubt but to America belongs the credit of first advancing the idea and technique of skin grafting. The late lamented F. H. Hamilton, that master mind, who was always in the advance guard of improvement in American surgery, in 1854 successfully transplanted skin to a raw surface. He had, however, seven years previous, in 1847, advanced the idea but failed to apply it to use until later on. We will not burden the Section with reviewing the history and the great achievements attained in the past upon this subject, but will detail briefly the object of this paper.

Case 1.—In October, 1889, J. L., a lad of 12 years, in attempting to jump from a moving freight train, had the soft and bony part of his right hand crushed under the wheels. Efforts were made to save the hand, but some five or six days afterwards I was called in to amputate it on account of sloughing. The thumb retaining some life, the hand was disarticulated at carpo metacarpal joint, leaving a stump of 24 square inches entirely devoid of skin. His mother earned her daily bread as a washerwoman. Her hands, from her daily avocation, became much caloused, and it was from this thick and indurated epithelial tissue that I obtained what proved to be most excellent material for grafting. Small pieces, about one line square, very thin, in fact not much thicker than tissue paper, were sliced with a sharp scalpel from the callosities of the palmar surface of his mother's hands. The granulations were first washed with 10 per cent. solution of warm creolin water and afterwards with saline solution of sterilized water. The surface from which the grafts were to be obtained was treated in similar manner; the grafts of epithelium, about six to ten in number, were then applied to the raw surface and covered with protective, which was held in place by rubber plaster; the remainder of the wound was dusted with powdered boracic acid, and the whole covered with moist gauze over which absorbent cotton, and lastly crinoline bandage. The dressing was changed every three or four days; all dressing removed, and new grafts applied upon a new field of raw surface. About 80 per cent. of grafts adhered and formed true skin covering. One peculiarity it will be well to call your attention to, and that is, the grafts must be applied precisely as they are cut off, for if you should reverse or turn them over, they will not grow, seemingly the vitality is entirely destroyed. This hand was covered with skin in about four weeks' time.

Case 2.—My next opportunity for applying this mode of grafting, occurred shortly after the above case. Mr. K., age 63, had a tank of boiling water emptied upon his neck, back, arm, and forearm, entirely destroying 400 square inches of true skin. This was covered after the method as above related, it requiring nearly five months to complete the cure, with very little contraction from cicatricial tissue.

Case 3.—Large indolent ulcer of left leg. Mrs. T., age 56; the ulcer was about three by six inches in size, of three years' standing, the surface of which was prepared for the grafts by denuding the surface of same with scalpel before applying the grafts; five weeks was required to complete a perfect cure, and has remained so since December last.

The advantages in this method over the use of skin, either in large or small patches, consists in the fact that there is no pain, or raw surface left

upon those who furnish the material, that the supply from the hands of those whose avocation produce the callosities is daily renewed and no discomfort in any way is produced by removing the thin slices of tissue from the thickened epithelial surface, that from three to six or more grafts can be cut from the same surface every three or four days without the subject suffering the least inconvenience; at the same time it is entirely bloodless. No local anæsthetic is required, a much greater number, or percentage, of the grafts uniting than in any other method, for in my hands and others it has exceeded 80 per cent. of grafts that united and formed true skin. The abundant supply of material to be obtained at all times, without any coercion, for if it cannot be obtained from the palmar surface of the hand no trouble will be experienced in procuring it from the planter surface of the foot, where callous epithelial tissue can be obtained from the foot of almost any person.

If I have interested you with this brief summary of my experience in this new form of epithelial grafting, and in your hands after faithful trial if it proves as complete a success as in mine, I shall feel warranted in saying that in a great majority of cases, where now other methods are used, this can be substituted.

THE NATIONAL TEMPERANCE HOSPITAL.

Read before the National Medical Temperance Convention, Staten Island, N. Y., July 16, 1891.

BY J. DAVIS, M.D.,
OF CHICAGO, ILL.

Taking a panoramic view of human life as far back as history or legend extend, we find that progress of mankind has been marked by a continuous evolution of mind. The objective point of man's ambition has ever tended toward the happiness of the race. As this evolution of thought has progressed, man has comprehended his environments and learned how to bring himself into harmony with his surroundings. He has learned the value of the constituents of the air he breathes, and discovered that oxygen is necessary in unlimited quantities for life and health. Civilization has taught him that his habitation should not only be beautiful, but well ventilated. He has found that for perfect physical health, his raiment should not alone be for ornament, but that in clothing his body, certain well defined physical laws cannot with impunity be violated. The same truths have been demonstrated when he has sought to determine what to eat and drink to sustain life. Through knowledge gained by experience and observation, he has improved the diet of his barbarous ancestry. He has endeavored to eliminate that which was found

to be injurious, and to retain the most nutritious. By so doing, he has added to the strength and beauty of the human form. And still the evolution of thought goes on; still we are making new discoveries, and finding that for thousands of years we have been traveling the pathways of error. The work is not yet completed. Man is not yet a perfect being—reason does not always guide—passion, appetite and desire still control individuals and, in many instances, nations.

Some time in the remote past, it was discovered that by the decomposition of fruit and vegetable juices containing sugar, a liquid was obtained, which, when drunk, produced a peculiar condition of exhilaration. This anæsthetic effect which they had over the nerve centres made these liquids much sought after. The knowledge of the methods of their manufacture spread rapidly over the entire civilized world, and the most extravagant claims were made as to their efficacy in health and disease. The secret of the popularity of these liquids has been, and is yet, the soothing effect resulting from the alcohol they contain. The destructive effects of these alcoholic preparations on the human system have been observed by thinking men for hundreds of years, and during this period, many spasmodic attempts have been made to stay the consumption of a poison that has seemed to threaten the destruction of mankind. But appetite has always baffled and smothered the voice of reason.

The one *great* hindrance that has stood in the pathway of reform has been the multitude of pathological conditions for which alcohol has been recommended by the medical profession. The average man is always glad of an excuse to gratify the craving of his appetite.

But mind ultimately triumphs. The evolution of thought has been at work upon *this* subject. In looking back over the history of the temperance movement for one or two hundred years, it is interesting to note the gradual steps of thought through which the mind has risen, 'till the subject occupies its present scientific aspect. At one time it was supposed that none of the alcoholic liquids were injurious, so long as they were not imbibed to the extent of intoxication. Again, it was suggested that the evil came only through the distilled preparations, while the fermented and malt liquors were harmless. Some of the temperance societies strongly advised that the use of ardent spirits be permitted on social occasions. It is only within the last few years, that organizations have come into existence on a platform of total abstinence.

Along with these views, the medical idea of the subject has been gradually gaining attention. The therapeutical application of alcohol has been growing more and more restricted. Slowly but surely, the evolution of thought has been unfolding the truth. It will not be necessary for me,

in the brief space of this paper, to go over step by step the various experiments which have led up to the present scientific estimate of the case. It is sufficient to state, that it is now pretty satisfactorily demonstrated that alcohol, when taken into the system, is not assimilated, but acts as a foreign irritating substance, and is ultimately thrown off from the system, unchanged. It may also be stated that, while passing through the body, alcohol so acts on the various organs and tissues as to disturb the physiological processes, and in this manner, gives rise to many of the diseases which afflict humanity. If these declarations be true, then alcohol is neither a food nor a medicine.

Recognizing these great truths, and observing the destruction of human health and life going on all over the world from the use of alcoholic liquors, some of the most intelligent members of the Woman's Christian Temperance Union met a few years ago, and organized the National Temperance Hospital, as an institution in which to demonstrate to the world, that disease could be *more* successfully treated without than with the use of alcohol. In the organization of such an institution, many conflicting ideas had to be taken into consideration. By some it was suggested that alcohol be completely abandoned, both in the preparation and administration of remedies. Again, it was thought that its use should be restricted to local applications alone. But it was finally determined that the hospital should not rest on any irrational thought, but stand as an exponent of the most advanced scientific ideas on the temperance question. Hence, alcohol has been discarded as an *active* medicinal agent. The use of all fermented and distilled liquors is prohibited. Tinctures and extracts, where alcohol has been used as a solvent, have been retained, as it does not enter into their preparation in sufficient quantities to be considered an *active* medicinal agent. The basic principles upon which this institution rests may be formulated as follows:

1. Alcohol is a poison.
2. When taken into the system, it is not assimilated, but passes the round of the circulation, and is finally thrown off through the organs of excretion, unchanged.
3. While passing through the body it disturbs the various physiological processes, and in this way lays the foundation for disease.
4. It does not stimulate or strengthen, but it depresses and weakens.
5. As it is not assimilated, it cannot be a food.
6. As it disturbs every physiological process, it cannot be a medicine.
7. There is no disease afflicting the body, that cannot be more successfully treated without than with the use of alcohol.

Everything pertaining to or connected with

this institution rests upon this platform. The nurses of the training school are instructed in these principles, and every member of the medical staff is expected to maintain and practice them, not only in the hospital but in private practice.

The work so far done by the hospital has not been large, but it is flattering. There are only accommodations for twenty patients. It is not endowed, but strange to say, and contrary to the history of most hospitals, it is not in debt, but more than pays expenses. The House Physician's Report for last year shows that during that period, one hundred and forty patients have been treated, and ninety-eight surgical operations performed, with the phenomenally low mortality of only 5 per cent. Owing to the necessity of making the institution self-supporting, the work so far done has been largely surgical. In no instance, either surgical or medical, has it ever been deemed necessary to administer alcohol. No accidents, or conditions approaching an accident, have ever occurred during the administration of an anæsthetic. Some five years of surgical work without the use of alcohol convince me, that many of the sudden deaths which occur while giving anæsthetics, are due to the unnecessary administration of alcoholic liquors during or previous to the operation. It would be interesting and undoubtedly instructive, if the statistics of this subject could be collected and published.

I thoroughly believe that a grave and frequently fatal mistake is made in debilitated cases, by the administration of alcohol preparatory to the performance of severe surgical operations. The patients in these instances, are compelled to endure both the operation and the depressing effect of the alcohol on the vaso-motor nerve centres. A very typical instance came under my observation in the hospital a few weeks ago, in a case of ovariectomy. The patient was a woman of 35, from the country. Owing to a mistaken diagnosis, the operation had been neglected till she was reduced to an extreme degree of emaciation. In this debilitated condition, and almost pulseless, she was placed on the operating table. Under the old *régime*, half a tumblerful of brandy would have been given. Two grs. of quinine had been administered four times a day for two days previous to the operation. She rallied without the slightest symptom of shock, and made a rapid recovery.

Among the operations performed in the hospital during the last year, I may enumerate hæmorrhoids, trachelorrhaphy, tracheoperineorrhaphy, Alexander's operation, fistula in ano, varicocele, schirrus of the breast, amputation of leg, laparotomy, removal of polypus of the womb, ovariectomy, and numerous minor surgical operations. The diseases treated have also been varied, as

septicæmia, peritonitis, chronic cystitis, paraplegia, tuberculosis, pneumonia, ovaritis, morphine habit, chronic alcoholism, Bright's disease, typhoid fever, intermittent fever, etc.

With the small beginning that we have made and the success we have already attained, we feel encouraged to pursue the work. The lesson already taught has been sufficiently convincing to impress the most skeptical that alcohol is not only unnecessary as an active medicinal agent, but that, in a majority of cases, it is an actual hindrance to the recovery of the patient. Slowly but surely, every year, this great truth is being impressed on the minds of the medical profession.

Says Herbert Spencer, "All great mental changes take place with deep laceration of feeling." This will be verified during the conflict that is arising in regard to the use of alcohol as a food and a medicine. Every foot of scientific advance will be contested by ignorance and fallacious argument. Ideas and beliefs that have been for centuries fed by passion, appetite and superstition, cannot be eradicated in a day. The process must be one of gradual education. Slowly but surely, the evolution of thought will accomplish this work. Truth, pure and uncompromising, will ultimately prevail. The present battlefield of the temperance fight now lies in the medical profession. If alcohol is a food and a medicine, all the eloquence and logic of modern thought cannot save mankind from intemperance. For man will never be able to take these liquids moderately and without harm. If alcohol is *not* nutritious, and serves no purpose as a therapeutic agent, then the world should be so instructed and its promiscuous use abandoned.

Surely the destruction that is now going on from the use of alcoholic liquids, deserves the immediate attention of the medical profession.

This must be the most potent factor in the production of human suffering. The danger that threatens the civilization in which we live is, that it may "crumble and fall from the corroding action of alcohol on the nerve and brain centres." The truth of our previous assertion must be demonstrated, and to do this, a hospital is necessary. The National Temperance Hospital is dedicated to this work. Its Board and Medical Staff send a greeting to the National Medical Temperance Convention.

SUBCUTANEOUS INJECTIONS OF CAMPHORATED OIL.—According to B. Alexander, of Berlin, hypodermatic injections of camphorated oil have a cumulative effect, causing, after the fifth injection, pains in the head. When used in diseases of the respiratory organs, in small doses, it has antipyretic effect. In heart diseases, where digitalis does not seem to be of further use, camphor injections will enable the action of digitalis to be resorted to again.

ADDRESSES.

AN ADDRESS DELIVERED AT THE OPENING OF
THE SECTION OF THERAPEUTICS,*At the Annual Meeting of the British Medical Association, held in Bournemouth, July, 1891.*BY WM. VICARY SNOW, M.D., LOND., M.R.C.P.,
Senior Physician to the Royal Victoria Hospital and the National Sanatorium, Bournemouth; President of the Bournemouth Medical Society.

Gentlemen:—On behalf of my medical brethren resident in Bournemouth, as President of this Section, I have a pleasant duty to perform, to give a most hearty welcome to our foreign guests and all members of the British Medical Association, on this their first visit to our town. Allow me also to thank the Council of the British Medical Association, for the honor conferred in allowing me to address you from the chair of this meeting.

In consequence of our more accurate knowledge of disease, and especially of those affections attended by febrile phenomena, since the introduction of the clinical thermometer, much progress has been made in therapeutics. We have been able to more correctly estimate the action of remedies, not only in health, but in disease, and hence treatment has become more scientific and rational. It is not, however, too much to expect that the greatest triumphs of the future may arise from the new study of animal chemistry and bacteriological research.

In specific disease we have learnt that it is not only the microorganisms present which have to be considered, but that it is probable the chemical changes they set up play a most important part in causing the phenomena of disease. It is well established that certain zymogenic organisms give rise to a chemical product inimical to their own growth, and when of a certain strength sufficient to stop the process. The mortality from consumption is now, in England, not more than one-half of that existing during the first fifty years of this century, while the death-rate from this disease has increased in many countries. This grand result has been obtained by improved methods of treatment, sanitation, improvement in the workshops and dwellings of the laboring population, and especially by the subsoil drainage of towns. In the year 1882 the tubercle bacillus was discovered, and it was proved that consumption could be produced in animals by the inoculation of a pure cultivation of it. Briefly, it has been demonstrated that without the bacillus no lung affection can be considered consumption. True, however, as this statement is, to my mind it is not sufficient to account for the production of the disease. The bacillus and its spore have great vitality, and must be, as a rule, present in our houses, and especially in our hospitals for consumption. Further, an appreciable percentage of animals slaughtered for food are said to be tuberculous, nor is the bacillus destroyed by imperfect cooking. Granted that it has been proved that this disease is occasionally produced by contagion, yet we do not find those employed in our consumptive hospitals more liable to infection than the ordinary population. I must hold, then, that the bulk of mankind are proof against the attacks of the bacillus, and that it can only fasten on the tissues of those weakened by bad hygienic or climatic conditions, repeated lung congestions, or hereditary taint. So far no drug has been proved capable of destroying in the human body the tubercle bacillus, or arresting its development by action on the diseased tissues in which it finds its pabulum. For years I have used carbolic acid and other inhalants, and found decided benefit arise in soothing cough and other symptoms, but no evidence whatever could I discover of their exercising any influence on the growth of bacilli. In cultures, a moderate advance above the natural heat of the body prevents the growth of the bacillus, and it was assumed that consumption

might be cured by the inhalation of heated air; but in practice it was found impossible to raise sufficiently the temperature of the air in the lungs, and this treatment has now fallen almost into oblivion. The insufflation of sulphuretted hydrogen into the intestines has entirely failed, nor has any drug yet been proved to be able to influence the growth of the bacillus when injected subcutaneously, but trials are now being made in this direction.

At the International Medical Congress last year, it was announced by Koch that a remedy had been discovered which conferred on the animals experimented on an immunity against inoculation by the tubercle bacillus, and which would arrest tuberculous disease, and that the remedy would be tried on human beings. In spite of all precautions exaggerated reports of the value of the remedy were propagated, and the public impatience, and, it is even hinted, Government pressure, induced him to make a partial disclosure of the nature of the remedy and the method of its use before any sufficient experience had been obtained of its effects on the human body.

When this discovery was first announced it was compared to that of vaccination and Pasteur's treatment for hydrophobia, but several very marked distinguishing points induced most reflective minds not to anticipate equally good results.

Jenner was dealing with small-pox, a disease as a rule occurring only once during life, and rendered the system incapable of an attack by the substitution of a form of the same disease weakened by transmission through the cow. In hydrophobia the remedy is introduced into the system after the contagion, but before the symptoms of the disease have manifested themselves. In Koch's method the remedy is not applied until after the disease is established, and can only arrest its further progress, but cannot repair the damage already effected.

The public excitement was increased by a not unnatural mistake of the daily press in calling the remedy a "cure for consumption," instead of a "new remedy" for the treatment of that affection. The medical profession were also greatly impressed by the immediate beneficial effects produced on some surgical affections, and notably on lupus; sufficient time had not then elapsed to prove that the results were not always of a permanent character. Hence, even before the manufacture was perfected (and I have reason to believe that the first tuberculin produced more serious symptoms than supplies subsequently sent out), a treatment requiring the greatest care was initiated in the middle of almost the most severe winter of the century, and mainly in the foggy, crowded, and in many instances insanitary large cities of Europe.

One result only could follow: the unreasoning belief of the multitude in a new remedy was disappointed, cases of mischief from its use were reported, statements against it, often I believe beyond what science would justify, were made, and a danger existed, and still exists, that a discovery, which at any rate merits a fair trial, may be discredited and even consigned to oblivion from the rash way in which it was introduced. In consumptive people, even when not much tissue is affected, a small injection of tuberculin—as little as 0.002 cubic centimetre—may cause intense febrile reaction, and, from the frequency with which stained expectoration has been noted, we may infer that active congestion is set up wherever tuberculous tissue exists, whether in the lungs, kidney, or brain membranes; hence the danger of its use where complications either exist or, as in the very young, may be feared. Would any physician, if he had the choice, wish to treat a case of pulmonary phthisis in the air of a large city, during the time of smoke and fogs, much less put him on treatment which, for the time at least, must produce considerable febrile reaction? It appears to me that, instead of in Berlin, the treatment should have been initiated in good country air, and

when completed the patients should have been removed to an approved climate.

Before the injection of tuberculin can be adopted as a recognized method of treatment for consumption, the following question must be answered in the affirmative: Can this treatment be carried on with reasonable safety? In very weakly patients and those with extensive and advanced disease, such a treatment must be attended with risk, and it is not surprising to hear that fatal results have directly followed the injection of tuberculin. The ten cases treated at Ventnor, the similar number treated in the Sanatorium, coupled with the experience of Dr. Coghill at Ventnor in private practice, and my own, inclines me to believe that tuberculin may be safely used in cases judiciously selected, under favorable circumstances. I will now, as briefly as possible, call your attention to the only three cases I treated in the Sanatorium in the year 1890, and I do so because I have been able to trace the results over a period of seven months from the first injection.

E. M. was admitted on November 6, 1890. She had lost three sisters from consumption, and other relatives, had been ill more or less for three years, and had had one attack of hæmoptysis. Her afternoon temperature ranged from 90 to 100°. The expectoration measured 3ss, was muco-purulent, and contained bacilli. The resonance was imperfect at the apex of the right lung, and the respiration bronchial; the left lung was affected to a less extent. The treatment was commenced on December 6th and completed on January 30th. Twenty injections in all were given. The patient had lost 4 lbs. in weight in the previous fortnight, and lost 6 lbs. more during the first four weeks of treatment. On January 30, the patient had very little cough or expectoration; did not react to 0.01 cubic centimetre, but bacilli were still present. She continued to steadily improve, and left the hospital on April 21, having lost all cough and expectoration and gained 12 lbs. in weight from the lowest point. Her temperature was normal, and, on examination, the physical signs were found to have improved. The last expectoration obtained contained no bacilli. She had been previously living at home without occupation; she now writes—July 2nd—that she has remained perfectly well, and has entered domestic service as nurse. As the patient was losing weight before, and for a month after, the commencement of the treatment, and had an exceptionally bad family history, and, as no symptoms of relapse have been observed up to seven months from the commencement of treatment, I think we may fairly claim that the disease has been arrested; no case of consumption can be considered cured until all symptoms have ceased for two years.

A. D. (dressmaker), 18. Admitted November 3rd. Duration of illness nine months. A sister consumptive. Had gained 2 lbs. in weight before treatment commenced on December 6th. Beyond slight dulness and prolonged expiration at the left apex, no physical signs existed; the expectoration was scanty, and contained a few bacilli; evening temperature, 99.8°. Eighteen injections were given but, in consequence of the severity of the reactions (104.8°) the amount was not carried above 0.005 cubic centimetre. January 30.—Patient feels perfectly well; has no expectoration or cough, and has gained 5 lbs. Physical signs unchanged. She continued to improve, and gained from the commencement of the treatment 12 lbs., and was discharged on April 22. She writes, July 2nd: "I think I am about the same weight as when I came home, having neither cough or expectoration, nor do I perspire at night; I am, also, able to follow my employment without difficulty." You will observe that tolerance of the tuberculin could not be established, and that the amount of the disease was very slight. It is quite possible that to the change of climate and rest from work the improvement is due.

W. H. (footman), aged 23. Three years before pleurisy with effusion, expectoration 3ss.; muco-purulent,

containing numerous bacilli. Considerable consolidation existed at the apex of the right lung, weak breathing was noted at the base and dry friction in the right axilla. The left lung was only slightly affected at the apex. Sixteen injections were given from December 4 till January 17, and then discontinued in consequence of a very severe attack of dyspnoea. Three times the expectoration was stained with blood, six times dyspnoea was noted. The febrile reactions were moderate. The treatment was resumed with a fresh supply of tuberculin on February 17, and continued until on March 19, no reactions followed the use of 0.01 cubic centimetres. The patient was discharged on April 9. He was feeling much better. The percussion note had improved and the breathing became more vesicular. The temperature was normal and the cough and expectoration slight. No bacilli could be found in the expectoration. He gained 4 lbs. in weight before the treatment was resumed, and during it lost 3 lbs. He shall speak for himself as to his after-progress in a letter to the lady superintendent, June 12:

"MADAM,—I am very pleased to tell you I have improved in health very much since I left the Sanatorium. I have gained in weight seven pounds, and I have been in work a fortnight now, and able to do it with pleasure, and feel it only right for me to let you know the good I got at the Sanatorium through Dr. Koch's treatment. I have hardly any cough, and I get no pains at all. I am pleased to say I am going to the Cape in July, so as to get out of England before the winter comes on, as my doctor thinks the fogs might strain my chest too much. I am pleased to tell you he gave me a good account of myself; he said of all the cases he had seen, mine was the best."

Subsequent reports confirm the improvement in this case. I will now allude to the result of the only three cases I ventured to treat after softening had taken place.

E. M., 44, had a slight attack of hæmoptysis five years since; softening had commenced at both apices. First injection February 6, 1891; discharged May 12. This patient improved in strength and gained in weight 16 lbs., but I could detect no signs of improvement in the lung condition.

E. K., 22. Two months since a slight attack of hæmoptysis. In this case, also, softening had commenced on both sides, and a small cavity existed at the right apex. First injection February 24; discharged June 15; gain in weight, 10 lbs. The improvement in the physical signs was slight. Numerous bacilli were found in the sputum.

These two patients, when admitted, were almost normal in temperature, and I am inclined to think much of the improvement in weight was due to rest from employment, better food, and change of climate. I am fortified in my opinion by the result of the third case.

C. H., 21, had been resident in Bournemouth and under observation two years, and had done clerical work at the Sanatorium. The treatment was carried out at his home without difficulty, although before, and when he at first came to Bournemouth, hæmoptysis had been a feature in his case. The physical signs improved, but he did not gain weight.

The treatment was carried out with the antiseptic precautions recommended, and no evil consequences followed the punctures. The patients were placed under the best hygienic conditions possible—kept in bed during the febrile reactions, and fed mainly on a milk diet. It may be asked, What unpleasant symptoms were observed, and is previous hæmoptysis a bar to the treatment? Although stained expectoration was frequently noted, it was never sufficient to cause anxiety, and never more than a temporary intermission of the treatment. Pain in the lungs, and especially where old pleurisy had existed, often occurred; in one case severe dyspnoea was observed. I have already mentioned that it did not recur when the treatment was continued with the fresh tuberculin.

Limits of space debar me from entering on the pathology of the remedial effects of the treatment, and I am pleased to tell you I have had no opportunity of studying post-mortem appearances.

Stimulated by Koch's discovery, the inventive faculty of the profession has been at work, and, as I write, new methods of treatment are under trial, especially in Paris. May they be tried under more auspicious circumstances, and not prematurely introduced. Whether this discovery be a success or a failure, I feel that a line has been indicated pregnant with grand results, not only for the arrest of consumption, but also for the treatment of other diseases.

BOOK REVIEWS.

SURGICAL BACTERIOLOGY. By N. SENN, M.D., Ph.D. Second edition. 8vo., cloth, pp. 265. Philadelphia: Lea Brothers & Co., 1891. Chicago: A. C. McClurg & Co. Price, \$2.

This second edition of Senn's Surgical Bacteriology has been changed from the former edition by division into chapters, and by bringing the literature of the subject to the date of the revision, viz., March, 1891. The work is, therefore, at this time, the most complete of any. Prof. Senn's acquaintance with the languages of Europe has enabled him to make a complete digest of the European literature bearing upon this subject, and his untiring industry caused him to glean all that is valuable. His own original experiments, while doubtless giving color and direction to his thoughts, are seldom put forward, but the work stands just now as the best practical review of the literature of surgical patho-bacteriology in existence. The duration, however, of this kind of work is necessarily short. The vast and rapid changes that are going on in bacteriological discovery, heralded from week to week in the medical journals, and by publications direct from the great laboratories, render a book on bacteriology antiquated while yet warm from the press, and Prof. Senn will find that his classical book of experimental surgery will be quoted long after the "Bacteriology" has been raised to a top shelf in the library. His development of the hydrogen gas test and decalcified bone plates will perpetuate his unchallenged supremacy in his especial field, and compilations, however temporarily useful they may be, will not materially add to it. There are many compilers, but the investigator must be born with natural qualifications for the work, and hence they are few. But we must no longer digress, however tempting the theme. The book under consideration, strictly speaking, covers the essential portions of surgical pathology, and whoever, in this year of our Lord, 1891, would have a clear and comprehensive digest of the existing European literature of surgical patho-bacteriology will find it in this

volume. The illustrations are inserted on separate sheets from the text, and are beautifully executed. The book is well worthy of the time-honored medical publishing house that issued it, and the fact that it has passed to its second edition is the highest testimony of its great merit.

THE SURGICAL TREATMENT OF WOUNDS AND OBSTRUCTION OF THE INTESTINES. By EDWARD MARTIN, M.D., and H. A. HARE, M.D. 8 vo. cl., pp. 165. Philadelphia: W. B. Saunders. 1891. Price, \$2.

This little volume is the essay which received the Fiske Fund prize at the annual meeting of the Rhode Island Medical Society, held at Providence, June 12, 1890. The essay is divided into fourteen well-written chapters, which state in the best form the teachings of the day in regard to the subject. The authors also furnish a table of cases of cœliotomy for gun-shot wounds of the abdomen, and a careful summary of the tables. The chapters include the subjects of Intestinal Obstruction due to Congenital Malformations, Intussusception, Internal Strangulation, Volvulus, Obstruction from Foreign Bodies, Intestinal Paralysis, Chronic Obstruction and Peritonitis. There is a chapter on Diagnosis and on Wounds and Rupture. The tables are marred by bad proof-reading of the names of surgeons whose cases are quoted. Among the Americans thus pilloried we notice the following: W. S. Bull, instead of W. T. Bull, four out of five times; G. Hamilton instead of J. B. Hamilton and Kinlock instead of Kinloch. We trust that the European surgeons have met a better fate at the hands of the essayists.

Notwithstanding the carelessness here noted, the authors have not only produced a very readable book, but one of extreme value, and the practiced hand of Dr. Hare is everywhere manifest in the "make-up" and literary character of the book. One of the doctor's ardent admirers recently said that he was of impression that Dr. Hare had an open contract to produce seven-eighths of the literature of the present decade, without regard to subject; and it must be admitted that if the allegation is true, medical literature will be the gainer, in clearness of expression, graceful sentences, and conciseness of statement. The book under review is an example in these respects which Americans can well afford to compare with similar works abroad. We notice here, without, however, subscribing to their conclusion, the strongest protest against surgical interference and intestinal suture in cases of gun-shot wounds of the intestine, and the authors claim that the results of cases treated expectantly are as good as those by laparotomy. They cite two instances where Senn's hydrogen gas test has failed to show the perforations.

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BY-LAW IV.—THE PUBLICATION OF PAPERS AND REPORTS.

No report or other paper shall be entitled to publication in the volume for the year in which it shall be presented to the Association, unless it be placed in the hands of the Board of Trustees on or before the first day of July. It must also be so prepared as to require no material alteration or addition at the hands of its author.

Authors of papers are required to return their proofs within two weeks after their reception; others, if they will be passed over and omitted from the volume.

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LONDON OFFICE, 57 AND 59 LUDGATE HILL.

SATURDAY, AUGUST 8, 1891.

CHEMICAL ANALYSIS OF FOODS.

One of the first of the artificial foods for infants, was that of LIEBIG. It was made by a master hand, so far at least as its chemistry was concerned. It contained the exact amounts of albumin, sugar, fat, and salts necessary for the nutrition of the child. But an extensive use proved that it failed in its object. The lesson which it teaches is only slowly gaining ground. That lesson is, that the animal organism requires something more for its maintenance than so much albumin, so much fat, and sugar, and mineral matter. It requires that these substances shall be of such kind, and in such form that they can be both digested, and assimilated. The examination of the food of the properly nourished individual, shows that he requires for instance, a given amount of proteid. Certain foods contain the proper amount of proteids. It is thereupon assumed that these foods will answer the requirements of nutrition, which does not always happen. This is not the first nor the only time that physicians have been misled by a name. It is a little difficult to realize that a name is only a convenient tag, and does not always reveal completely the contents of the bundle to which it is

attached. What is a proteid? Something which has certain definite chemical reactions. Certain differences in reaction enable chemists to separate in a crude, but convenient way, the proteids into several classes. But the separation of the proteids into classes, and indeed the very recognition of the proteids themselves, is by no means wholly artificial, and the several tests for these purposes give no idea whatever of the structure of these substances.

The various proteids certainly are available as foodstuffs, but under what conditions each is most effective as a nutrient, is not known. Moreover, this question is a biological one, and, at present at least, far beyond the ability of chemistry to answer. It should therefore be clearly realized, that the term proteid is a purely chemical one, and gives name to a group of substances which answer the requirements of indirect, almost artificial chemical tests, and that the taking of the word in the broader biological sense, and making practical applications as such, is liable to terminate in disappointment, as in the LIEBIG instance.

Physiologists have shown conclusively that common salt is the only mineral substance, iron possibly excepted, which has a direct food value. All other so-called mineral elements are available for food only when they form constituent parts of the complex molecules of the various organic foodstuffs. For instance, it has been attempted to supply the deficiency of lime in the bones in rickets, by the administration of calcium phosphate, but without success. The animal organism is unable to build calcium phosphate into bone tissue. It must receive its calcium and its phosphorus in some other combination. This combination, to be assimilable, must be an organic one, such as is found in the yolk of the egg, to give a single example. To destroy a cereal by heat to obtain from the ash the phosphate produced, is an illogical procedure. Identically the same products can be formed in the laboratory at much cheaper rates. The condition which made this ash available as a food, was its existence in organic combination in the grain, and this availability was destroyed with the destruction of the grain.

At a meeting of the Association a few years ago, the writer heard a well-known member remark to a food manufacturer, who was demon-

strating by chemical tests the large amount of albumin present in his beef extract, that it was quite immaterial how much albumin it contained, that the chemical test was worthless, that the only test of the value of his food was the clinical observation of its assimilability. This seemed at the time a little severe to the writer, who was still impressed with the equivalence of chemical and nutritive terms. To-day he can heartily endorse the observation.

It is not intended to deny that chemical analysis is of some value in assisting in the selection of foods, but one must be guided in making these analyses by a clear and full idea of their scope, and their limitations. Ultimate analyses of foods are of very little use in determining the nutritive value of these substances, and are often very misleading.

THE PATHOLOGY OF QUININE AMAUROSIS.

DR. DE SCHWEINITZ, of Philadelphia, has contributed in the *Ophthalmic Review*, February, a paper on the results of some experiments undertaken by him to determine the lesion of blindness from quinine. He administered the drug by the hypodermic method in a series of six dogs, using doses varying from 1 grain to 6 grains to each pound of the body-weight. The result of this procedure was a loss of vision in from three to fourteen hours—the exact interval before the onset of blindness not being ascertainable; this symptom was also commonly accompanied with other general disturbance within the same interval of time. In one instance the loss of vision remained practically complete for a period of twenty-nine days in consequence of a single dose of $3\frac{3}{4}$ grains to the pound of body-weight. The ophthalmoscopic appearances were essentially like those found in man having amaurosis from quinine. In every case the pupil was immovably dilated. Each dog was killed—if he did not die from the effects of the drug—and a microscopical examination was recorded of the eyes, optic nerves, chiasma and occipital lobes. No gross lesion, with one exception, was found in the nerve, disc or retina; in the exceptional case there was in one eye a decided dilatation of the blood-vessels, with white thrombi in the smaller veins, while the central vein was plugged with a clot. A dilatation of the vessels, to a

minor degree, was observed in the optic disc in some other cases. No marked lesion was found when examining transverse sections of the nerves, except at times some œdema was observed and a slight apparent increase in connective tissue. It is worthy of note, however, that even in dogs blind from quinine for a month and more, there was no appearance of atrophy of the nerve fibres, nor in the earlier stages was any neuritis discoverable. No abnormal change in the chiasma was observed in any instance. Sections of the cuneus showed in every instance a remarkable dilatation of the pericellular lymph-spaces, with degeneration of the protoplasm of the cell, and the lesion was most marked in the case of the dog that was longest blind. The author does not assert that he has in this lesion discovered the true pathology of quinine blindness, for the reason that he appreciates the room for imperfections in microscopical studies of this nature, but he believes that his observations will strengthen the position of those who have located the lesion in the optic nerve somewhere between the chiasma and the eyeball, and that œdema enters into the question as being a part of the morbid alteration. It is also well to bear in mind that the peripheral circulation may possibly be affected, as instanced by that one exceptional case where a clot was discovered in the central vein. This was, without doubt, an extreme instance, and should a like change take place in the human subject, any chance of recovery from blindness would be nearly or quite hopeless.

BEER VERSUS BRANDY.

The manufacture and consumption of fermented liquors is sometimes urged in the interests of temperance, on the ground that it diminishes the use of distilled spirits. That such is not necessarily the case seems pretty clear from the statistics of the countries in which wine and beer are most largely consumed. The *Irrenfreund* has lately called attention to the alarming prevalence of drunkenness in Germany. The consumption of beer, throughout the German Empire, is a little less than half a pint per diem for the whole population—men, women and children. Large quantities of wine are also consumed. There is probably no country where the conditions are so

favorable for temperance, on the theory above alluded to. Nevertheless, Germany ranks third in the consumption of distilled spirits, consuming eleven litres, or twenty-three and one-fourth pints per capita of the total population. Denmark consumes twenty, and Russia twelve litres per capita. Even if it be granted that the consumption of such an amount of wine and beer in Germany is in itself an unmixed benefit, it is not evident that the more deleterious forms of alcoholic indulgence are suppressed by it to any great extent.

Wine has been, from time immemorial, the national drink of France, as beer is of Germany, but the consumption of spirits is steadily and rapidly increasing in that country. The total amount consumed in 1890 is reported by the Minister of Finance at 37,395,000 gallons. In the department of the Lower Seine it amounted to three gallons per capita of the population.

Vienna is celebrated for its beer, and is in the midst of a wine-growing country. Of 516 men admitted to the city insane asylum in 1888, 143 are reported to have become insane exclusively through alcoholism, and in 93 more cases it is reckoned as a contributing cause. On the whole, it seems as if the friends of temperance would have to look in some other quarter for allies in the suppression of drunkenness.

GRAFTING CANCER IN THE HUMAN SUBJECT.

At a recent meeting of the Paris Académie de Médecine, CORNIL reported two cases of successful grafting of malignant growths in the human being. He stated that the first case had been communicated to him by a foreign surgeon, whose name he withheld, and whose act he did not justify. This surgeon removed from a woman, a breast which was the seat of an enormous tumor; then while the patient was still under the influence of the chloroform, and of course without her consent, cut a small section of the tumor and inserted it under the skin of the opposite healthy breast, using the strictest antiseptic precautions. The wound healed by first intention and for the first few days nothing was noticed at the site of the graft, but soon an indurated nodule developed and in two months, having grown to the size of an almond, was removed by the same surgeon.

Both tumors were examined by CORNIL, who

found them to be sarcomata and identical in structure. The ingrafted portion of the first tumor had become a part of the healthy breast, vessel anastomoses had occurred, its cells had penetrated into the healthy adjacent tissues, and its rapid growth was indicated by the karyokinesis of the cells. Shortly afterward the patient died of some acute intercurrent malady, and the autopsy, which was made with great care, revealed no trace of sarcoma in any portion of the body, neither in the lymphatic glands, internal organs, or the spongy tissue of the bones.

In the second case, a portion of a tumor removed from a breast was in a similar surreptitious manner inserted into the healthy breast of the patient. This tumor proved to be an epithelioma. The second graft, like the first, produced no inflammatory reaction, but later at the site of its insertion a nodule developed. The patient declined to have the second breast removed, and disappeared from the surgeon's observation.

It is pleasing to note that the French Academy at the close of the reading of this paper, expressed only its stern disapprobation of the methods employed, and by silence refused to discuss the scientific aspects of the cases. The indignation was not confined to the Academy, but also found vent in the public press, and CORNIL felt compelled to defend himself in a letter to *Le Temps*, in which he defends the publication on somewhat remarkable ground. He compares it to the breaking of a bridge in a railroad accident, the causes for which are sought in the midst of the calamity. He further instances the well known case of Alexis St. Martin, whose accident gave DR. BEAUMONT an opportunity to investigate the function of the stomach. From these he urges that while we must condemn the surgeon who did the work, we ought not to ignore whatever the unfortunate occurrence may teach us. This is pure sophistry. It ignores the grand object of medicine, which is to relieve suffering, not to acquire abstract knowledge. And questions which require for their solution the infliction of needless suffering on human beings, must wait until a proper opportunity for their solution presents itself. We cannot afford to stultify our profession, whose great boast, and whose legitimate boast, is its humanity, by such criminal acts.

Putting humanity entirely in the background, such experiments can not be defended even in the

name of science, for they are not scientific. They prove only that the implantation of a sarcomatous or epitheliomatous mass in persons already suffering from the corresponding disease is capable of causing a local sarcomatous or epitheliomatous growth. This does not prove that these growths are infectious, for who can say that some other form of irritation in these same individuals would not have caused like results? The gain to science by these experiments is decidedly problematic, at most it is insignificant, and utterly incommensurate with the cost at which it was obtained. We could far better have afforded that such experiments should have forever remained untold, than have gratified, perhaps to some extent justified, the individual who made them. If, however, the storm of indignation which has been aroused shall deter others who might have in view, in their zeal for science, similar unjustifiable experiments, CORNIL'S publication will have had a real, though unexpected value.

It remains to be said that since the Parisian affair, PROFS. HAHN, and VON BERGMANN of Berlin, have both been openly charged, by an officer of the German Government, with having inoculated cancer in the healthy human being. Their reply has not yet come to hand.

A CASE ARBITRATION.

Last week we took occasion to note the result of a recent trial for malpractice, and on account of its fairness and justice published in full the decision of the Appellate Judge who heard the case. This week we note another instance in which suit was brought against one of the most prominent physicians in this city, and by consent submitted to a board of three physicians chosen to act as arbitrators. A large amount of testimony was heard, the trial occupying an entire week. In the finding the arbitrators unanimously decided that the defendant was not guilty as charged by the plaintiff. The plaintiff alleging that the defendant had improperly diagnosed and treated the case. The arbitrators found the defendant's diagnosis to be correct and the treatment in perfect accord with the laws of medical science.

The method of settling disputes by arbitration is one commonly adopted by merchants and others engaged in the common business affairs of

life, and is highly satisfactory to all concerned except the attorneys. This is the first instance within our knowledge where this plan of settlement has been adopted in a case where an individual believed himself unskilfully treated by a physician.

Such a method of settlement should always be resorted to when it is possible to do so, and no case allowed to be brought before any other tribunal unless the plaintiff give bond for all costs incurred by the defendant where the case is decided in defendant's favor.

LIFE INSURANCE AND SYPHILITIC "RISKS."

MR. JONATHAN HUTCHINSON has published a paper in the *London Practitioner* on the "Modern Treatment of Syphilis," in the course of which he considers some of the more important relations of syphilis and life insurance. He states that he had recently been requested by a life insurance company to formulate a code of rules for the guidance of its examiners when considering the acceptance or rejection of applicants for insurance who have had syphilis. His advice on this subject was for the most part favorable to the applicants; with this exception, however, that he would decline those persons who at the time of their presentation, shall be undergoing the active development of secondary symptoms. These applicants, he advises, should be told to wait until these symptoms had disappeared. He based this counsel on the fact that it is always desirable to know how well or how ill the syphilitic patient sustains the specific treatment proper to the second stage of the disease, and also how willing and attentive he may be to follow out the directions of his physician. Mr. HUTCHINSON holds that an insurance company might make a profitable business out of syphilitic risks accepted in the early stage of the disease and taken at the ordinary rates, for he has found that the threatened life is often a long one. In his experience such syphilitic persons appear quite as likely to attain to length of days as others who have not been syphilitic. In the cases of those who present themselves free from symptoms, but who have the history of a former attack, the advice is that they be not refused, provided that they have not definitely become the subjects of the tertiary lesions of the disease, or have not, owing to

diagnosis or inadequate treatment, had a prolonged seige of secondary symptoms. But even among these there are not a few who would be regarded by Mr. Hutchinson as eligible risks at ordinary rates.

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

In the New York letter published in *THE JOURNAL* of July 25, by a slight mistake in the placing of quotation marks, Dr. Morton is credited with some remarks on the turn of pauper and diseased immigrants which were not made by him, and the quotation from Dr. M. should read with the paragraph referring to the colony for the same at Ghent.

Since that letter was written, the Treasury Department at Washington has issued a circular calling the attention of all corporations and others engaged in bringing alien immigrants into the United States to the laws of this country regulating immigration, as amended in March 1891. In this it is stated that the evident disposition of many steamship lines, under the pressure of sharp competition, to gather up in Europe and bring to the United States all who, with or without the aid of others, can pay the now trifling sum of a steerage passage—regardless of their character or condition and regardless of our laws—compels on the part of the Government a close scrutiny, and the adoption of more comprehensive measures than have hitherto seemed necessary. While it is the purpose of the Government to enforce these statutes in their letter and spirit, it is desired that as little discomfort and distress as possible result to persons affected by the immigration laws. With this in view, it is important that persons of the prohibited classes be prevented from leaving their homes and crossing the sea, only to be sent back on their arrival here. It is wrong that either the greed of some steamship companies, the mistaken kindness of friends, or the wish of many foreign communities to be rid of burdens properly theirs, should be permitted to result in this useless cruelty. So far as possible, the stopping process should be applied at the beginning, not at the end, of the long journey.

The circular also gives notice that, inasmuch as some steamship lines, in order to increase their carrying capacity, have recently disregarded the provisions of the laws of the United States requiring a certain allowance of cubic air space to each steerage passenger, hereafter more thorough inspections will be made of all steamships engaged in bringing immigrants here, and that the penalty for violation of the law in this respect will be rigidly enforced.

It is a fact of great interest as regards the cause of medical education in New York that from this time on the salaries of the faculties of both the medical department of the University of the City of New York and of the College of Physicians and Surgeons are to be fixed

sums, and no longer dependent on the number of students matriculating. On July 1 the College of Physicians and Surgeons became, under the authority of the legislature, a part of Columbia College, and will in future be administered as such, the medical department thus made an integral part of the university system, instead of having a merely nominal connection with the central collegiate institution. It is also announced that, as has been the case for some time as regards the College of Physicians and Surgeons, a three years' graded course of study is now to be obligatory at the University Medical School. Another innovation at the latter institution is the introduction of the recitation system in place of the didactic lecture during the first and part of the second year.

The circular of information just published by the College of Physicians and Surgeons states that the large accretions to its teaching force, notably in the department of anatomy and in the physiological, pathological and chemical laboratories, permit the realization, to a degree hitherto quite impossible, of the great opportunities for instruction and research afforded by the excellence of the dissecting rooms, the laboratories and apparatus. The college building proper covers an area of no less than 15,428 feet, and the Vanderbilt Clinic, which is connected with it by a covered way, besides a very completely equipped dispensary department, contains numerous small rooms for the direct practical teaching of diagnosis and treatment to groups of students, and a theater for clinical lectures which accommodates an audience of nearly four hundred. During the year 1890, 120,000 patients were treated at this institution. The Sloane Maternity Hospital, also upon the college grounds, contains thirty-nine beds, all of which, by reason of its large endowment fund, are free in perpetuity. The obstetric service here is under the direction of the professors of midwifery at the college, the instructor in obstetrics being the resident physician; and the members of the graduating class are each required to attend a certain number of cases of labor in the hospital. The students of the third year are divided, at the beginning of the term, into classes of six, each section remaining on duty for one week, and during this time they are furnished with rooms in the dormitory free of charge. These lodgings are upon the college grounds, and are connected with the hospital by electric wires. Bedside instruction is given by the resident physician during the week, and at its close an examination is held in the hospital by the adjunct professor of obstetrics on the work of the week. From the time of the opening of the hospital to May, 1891, a period of three years and four months, 1,250 deliveries took place at this institution.

Owing, no doubt, in great measure to the continued cool weather, the health of the city still remains unusually good for this season of the year, the number of deaths being much smaller than the average of past years. During the week ending July 25, 947 deaths were reported, which represents an annual death-rate of 29.34 per thousand of the estimated population of the city. Considerably more than one-half of this total mortality, however, was in children under five years of age.

It has been suggested that the Public Works and Health

Departments might do good service together in promoting the health and comfort of the poor in a very simple way, now that New York, thanks to the new aqueduct, has at last an abundance of Croton water. Apartments in tenement houses are, as a rule, provided with stationary wash-tubs, and two of these tubs are generally placed side by side. The partition between the two is immovable; but if it could be taken out, and the two wash-tubs thrown into one, the tenants would have a bath-tub at their command. The Croton water rates upon bath-tubs have been so high that the use of this great convenience has been restricted, and the insufficiency of the water supply has been alleged as the reason. That reason exists no longer, and the official who would aid the tenement house dwellers in securing bath-tubs in their rooms, would certainly deserve to be classed as a public benefactor. P. B. P.

Section of Physiology and Dietetics.

To the Editor:—By order of Chairman C. H. A. Kleinschmidt, those interested in the Section of Physiology and Dietetics are invited to present papers or essays, and send titles to the undersigned, that we may get up the programme as soon as possible.

EPHRAIM CUTTER, Sec'y.

1730 Broadway, New York.

NECROLOGY.

Increase S. Hamilton, M.D.

Dr. I. S. Hamilton, one of the pioneer physicians of Southern Michigan, died at his home in Tecumseh, July 25, aged 82½ years. He graduated from the University of N. Y. at Fairfield in 1835, and at once started for the Territory of Michigan. Being without means he walked from Detroit to Lenawee County, where he practiced medicine for over 52 years. He encountered all the hardships and privations incident to professional life in the wilderness; building the first frame house and opening the first school in his part of the county. He was a pioneer in all religious and educational enterprises of the time. His reputation was unusually large for a country practitioner. He gave much attention to the diseases of women, and in their treatment, many years ago, he originated and successfully used "massage" when it was not recognized by the profession. He was a corresponding member of The Detroit Academy of Medicine, a member of The Southern Michigan Medical Society; The Michigan State Medical Society, and The American Medical Association.

MISCELLANY.

AN ARMY MEDICAL BOARD will be in session in New York City, N. Y., during October, 1891, for the examination of candidates for appointment in the Medical Corps of the United States Army, to fill existing vacancies.

Persons desiring to present themselves for examination by the Board will make application to the Secretary

of War, before September 15, 1891, for the necessary invitation, stating the date and place of birth, the place and State of permanent residence, the fact of American citizenship, the name of the medical college from whence they were graduated, and a record of service in hospital if any, from the authorities thereof. The application should be accompanied by certificates based on personal knowledge, from at least two physicians of repute, as to professional standing, character, and moral habits. The candidate must be between 21 and 28 years of age, and a graduate from a Regular Medical College, as evidence of which, his diploma must be submitted to the Board.

Further information regarding the examinations may be obtained by addressing the Surgeon-General U. S. Army, Washington, D. C.

C. SUTHERLAND, *Surgeon-General, U. S. Army.*

THE MEDICAL PRESS ASSOCIATION will meet in St. Louis October 14, on the first day of the meeting of The Mississippi Valley Medical Association. It is desirable that every Medical Journal in this country shall have its representative present on that occasion.

MEDICO-CHIRURGICAL COLLEGE OF PHILADELPHIA.—The following changes have been made in the Faculty: Dr. G. E. Stubbs, Emeritus Prof. of Clinical Surgery; Dr. W. S. Stewart, Emeritus Prof. of Obstetrics and Clinical Diseases of Women.

Dr. H. E. Goodman, Honorary Prof. of Surgery, Clinical Surgery and Orthopædics.

Dr. J. M. Anders, Prof. of Principles and Practice of Medicine, Clinical Medicine and Hygiene.

Dr. E. E. Montgomery, Prof. of Obstetrics and Gynecology.

Dr. Ernest Laplace, Prof. of Surgery, Pathology and Clinical Surgery.

Dr. W. F. Waugh, Prof. of Clinical Medicine.

THE TREATMENT OF FISSURED NIPPLE.—Dr. Barto Hirst, of Philadelphia, in the *University Medical Magazine* for March, advises the use of an application of equal weights of castor oil and subnitrate of bismuth in the treatment of fissure of the nipple. The nipple and adjacent parts should be thoroughly washed and disinfected before applying the ointment. One of the advantages of this application is that it need not be removed if it becomes expedient for the child to nurse at that breast. The ointment makes a smooth and flexible coating which not only serves as an efficient protective, but tends to reduce the pain and reflex irritation. For the many engorgement and pain that so frequently occur when the nipple becomes fissured, he advises the employment of lead water with laudanum, in addition to the ordinary sling-compress. The entire breast should be covered with a cloth wet with the lotion, and the applications should be repeated at short intervals. This line of treatment ordinarily prevents the formation of an abscess. It is best to allow the unaffected breast alone to be nursed, and the milk from the affected side can be drawn off with the breast pump. If it is imperative that the infant shall nurse at the fissured nipple, a glass shield with a rubber tip may be used.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from July 25, 1891, to July 31, 1891.

Asst. Surgeon Junius L. Powell, granted leave of absence for two months, on surgeon's certificate of disability, with authority for his admission to Army and Navy General Hospital, Hot Springs, Ark.

Surgeon Curtis E. Munn, U. S. A., is granted leave of absence for twenty days, to commence on or about August 5, 1891.

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No. 7.

ORIGINAL ARTICLES.

DEATHS FROM CHLOROFORM AND ETHER SINCE THE HYDERABAD COMMISSION. WITH CONCLU- SIONS.

*Read in the Section of Surgery and Anatomy, at the Forty-second
Annual Meeting of the American Medical Association,
held at Washington, D. C., May 5-8, 1891.*

BY LAURENCE TURNBULL, M.D., P.H.G.,
OF PHILADELPHIA, PA.

We live in an age of wonderful progress; in nothing is this better proven than in the multiplication of new and valuable books. The works of even one year becoming almost obsolete, new editions and new works taking their place. This is also the case with original experiments and investigations, crowding out the old. Nothing is lacking in either men or money. One of the most munificent works of this kind has recently been undertaken in even far-off India; the sum of five thousand dollars having been spent by the Nizam of Hyderabad in experiments on anæsthetics alone. This large sum was given, owing to the devoted efforts of Surgeon-Major Lawrie, of the Army of India, who is a great admirer and believer in the opinions held by the late Professors Syme and Simpson, of the Edinburgh School, in regard to chloroform.

There were two Commissions, one held in 1888, in which 141 dogs were killed by chloroform inhalation, and the symptoms and results of careful post-mortems were made. The chief conclusions which were arrived at, were, "that it is impossible for chloroform vapor to kill dogs by acting primarily on the heart, and this holds good, no matter in what doses, or in what manner the poisoning is induced." These conclusions having been received with doubt by many physiologists, and more especially by the editors of the *London Lancet*, led to the Second Commission, and Dr. Lauder Brunton, a well known author and physiologist, was added to the Commission. The conclusions of the Second Commission were published January 19, 1890. About six hundred animals, chiefly dogs, were employed in the investigations.

"The experiments of the committee were de-

signed to show the effect upon the blood-pressure, heart, and respiration of the inhalation of chloroform, ether, and the A. C. E. mixture, administered in various ways and under varying conditions. The objects of the Commission were five in number:

1. To test the suitability and safety of chloroform as an anæsthetic. The experiments with ether and the A. C. E. mixture were instituted principally for the sake of comparison with chloroform on certain points, and it is not pretended that they afford a complete exposition of the action of those agents on the system.

2. The effect of pushing the above-named anæsthetics (a) to a dangerous degree, and more especially until the respiration ceases; (b) until death results.

3. The modifications in the effects of these anæsthetics which result from (a) asphyxia in varying degrees and produced by various means, (b) from the use of drugs, such as morphine, atropine, physostigmine, and others.

4. The reality or otherwise of the alleged liability during ordinary chloroform administration to the occurrence of primary or secondary syncope or stoppage of the heart, brought about either by shock or through fatty or weak heart, or by hæmorrhage, or by changes in the position of the body. To investigate these points, in the first place a large number of operations, which are reported to be especially dangerous in reference to shock, were performed in every stage of anæsthesia, and numerous experiments were also made to show the effect of direct irritation of the vagus. Secondly, a number of animals were dosed with phosphorus before they were experimented on. This caused the weakening of the heart by fatty degeneration of its fibres, but at the same time other complicated changes in the whole of the organs of the body, not met with in the condition known as fatty heart in human beings. On the other hand, there are conditions often found in the fatty heart, such as changes of the coronary vessels, which were not produced by the phosphorus.

5. The effect of the anæsthetics above mentioned upon different animals, more especially upon monkeys, as the nearest approach to human beings."

We will not occupy your valuable time in giving the conclusions of the Commission in detail, but would refer you to the *London Lancet* and other journals which published the report. We will only state, in brief, the practical conclusions arrived at as to the effects of chloroform, "That in every instance the respiration stopped before the heart," and all that was necessary for safety was to attend to that alone. Soon after the publication of the views thus expressed, several practical English chloroformists gave their opinion, founded on professional experience, that chloroform was by no means to be considered safe by simply attending to the respiration, and that the heart still played a most important part in the deaths, as may be seen from the numerous deaths from syncope given in our tables.

With this view, I have made a most careful collection of all the deaths both from chloroform and ether, from every available source, assisted by several friends. These forty-three deaths have been arranged in a tabular form, giving the name, age, history, nature of operation, anæsthesia used, amount used, apparatus employed, posture, how long under influence, whether heart or respiration stopped first, means to resuscitate, how long continued, post-mortem, cause of death, and references.

The result of examinations and analysis of the table will be found on pages following.*

The whole number of deaths from chloroform and ether are forty-three. Of this number, thirty-nine were deaths from chloroform and four from ether. In five cases, the cause of death was syncope from chloroform, and in thirteen cases the heart stopped first. In ten cases the respiration stopped first, and in four cases the heart and respiration ceased at the same time. In one case cyanosis; no pulse. In twelve of the cases it is not stated which stopped first.

The cause of death in case 37, was due to some peculiar idiosyncrasy. In No. 22, paralysis of the pneumogastric nerve, the direct effect of the chloroform, superinduced by efforts at vomiting. After a careful consideration of the report of this case, and, as there was cyanosis after vomiting, we suspected suffocation, but this cannot be confirmed, as there was no autopsy. In case 20, there was given as cause of death, "Reflex paralysis of the heart," but there was no post-mortem to confirm this statement.

There were twenty-one post-mortems, most of them very imperfect. Nos. 24, 25, 36, and 37 were full and complete, and Nos. 15, 19, 21, 28, and 34 were fairly described in this particular.

* In preparing the "Table of the Deaths from Chloroform and Ether, since the Second Hyderabad Commission," we have received the assistance of Professor H. A. Hare, Dr. Joseph Leidy, Jr., and especially the kind labors of Dr. J. Melvin Lamb of the Library of the Surgeon-General's Office, U. S. A., at Washington. Every facility has also been afforded us by the lady Librarian of the College of Physicians of Philadelphia, and to all of these we return our thanks.

Many of the cases were very imperfect in their detail, especially those from New South Wales.

Sufficient cases are given to show the absolute importance in the method of administering chloroform, and to indicate the necessity of the most careful attention to the pulse and respiration. The only death from anæsthetics in Philadelphia, during the period stated, was one from chloroform (No. 36), while not a single death from ether in the numerous hospitals and operations—indeed we may say in the thousands of operations.

The thirty-nine deaths from chloroform added to the 375, collected by us from our work for Dr. H. C. Wood (contained in his address before the International Medical Congress, at Berlin), make, up to the present time, 414 cases—the actual number being far greater of cases never reported.

The exceeding small number of deaths from ether, demonstrates its great safety; still, that it will and does kill (and we notice that the feeble, and persons suffering from malignant disease are more apt to be its victims, see Nos. 10, 11, and 18), we would advise its use as an anæsthetic, and a full study and knowledge of the best modes of using it; which we judge is not the case in Europe.

It is true that "chloroform acts more rapidly than ether, is pleasanter to take, causes less congestion of blood in the veins, is much more portable and handy." The last two qualities render it preferable in certain classes of operations, *e. g.* in those on the eye, and in military or traveling establishments. On a campaign it would be impossible to find room to carry ether, or time to use it.

Again, ether cannot be used in hot climates or in close proximity to artificial light; nor is it suitable in certain conditions of the lungs, because ether is more apt to cause suffocation than chloroform, which is given with a much greater admixture of air. Against these advantages on the side of chloroform, ether has only one, which, however, is sufficient to outweigh them all; it is safer.

With regard to occasional unexplained deaths under chloroform, it must be remembered that they occur also under ether, though not so frequently, and used to occur in a similar way before the use of anæsthetics at all. Dr. Brunton also had several accidental deaths; but in every case, "the usual chloroformist was absent, and no one was attending to the chloroform"—a most significant statement. How often might the same be said (with a stress on the word "attending") in our hospital practice! The Hyderabad conclusions really imply a tremendous indictment against the administrators of chloroform—nothing less than that of causing death by carelessness. Unhappily, no one familiar with the administration of anæsthetics can doubt that there is some ground for this. How else account

for the widely differing records of different administrators? Every surgeon knows that with good chloroformists he is perfectly confident and easy, with others the reverse. The last word has by no means been said upon this controversy; but if we may venture a prophecy, it is that the answer to the question "Is chloroform safe?" will eventually be, "That depends on who gives it."

We would refer to the experiments of Drs. H. C. Wood and H. A. Hare (*Medical News*, February 22, 1890), results which are positive proofs in opposition to the experiments and statements of the Commission, that chloroform may arrest the heart before arrest of respiration. In one experiment, breathing continued two minutes after the heart had ceased to act.

The Pulse During Chloroform Anæsthesia.—A case in point, in which chloroform so depressed the pulse, that ether had to be resorted to. The British Medical Committee (1890) on anæsthetics,¹ after examining the kymographic tracings taken by the Hyderabad Commission, cannot agree with the Hyderabad Commission in holding that there is no danger to the heart during the administration of chloroform. Both committees have found that death occurs by failure of respiration in the great majority of cases, and that chloroform causes a gradual fall of blood pressure, which in itself is a source of danger. Both have also observed that in addition to this gradual fall, there may be sudden and unexpected falls, with slowing of the heart; but as to the explanation of these falls, they differ. The Hyderabad Commission holds that these falls, during which life is in jeopardy, are caused by asphyxia, while the British Medical Association Committee affirm, that they are due to failure of the heart, due to a specific action of the chloroform upon the organs (from which ether is free). The general conclusion of the British Medical Association Committee is, that while recognizing the great value of the work done by the Hyderabad Commission, and more especially as aided by Dr. Lauder Brunton, they consider that the commission attach too much importance to the most common mode of death from chloroform—failure of respiration—and fail to recognize the danger to the heart that may arise in certain physiological conditions. They consider it unwise and unsafe in practice to pay no attention to the state of the circulation, and to observe respiration alone. Further they consider it unwise to convey to the public, even through the profession, the notion that there is practically no danger in the administration of chloroform."²

In the *Manchester Medical Chronicle*, January 7, 1891, (page 276), Dr. Lawrie, President of the Hyderabad Chloroform Commission, makes the

following statement in answer to Alexander Wilson, and others, in their reviews of the Hyderabad Commission, published in the *Chronicle* of February 9, 1890. Wilson concludes his review as follows: "Increased knowledge has added nothing new to the direction for its (chloroform) administration." Lawrie states, "The Hyderabad Commission was appointed to confirm or disprove Syne's and Simpson's principles, that we should be guided as to the effect of chloroform entirely by the respiration. The Commission has not only proved that these principles are sound, but has also proved that the art of administering chloroform with safety consists in keeping the breathing absolutely regular throughout the inhalation. This proof is new, and has never been established before. After criticising the teachings of Wilson, he states that the Commission has shown, 1, that the lowering of the blood pressure, which chloroform and all anæsthetics cause when efficiently administered, is in itself a harmless event, if the respiration alone be attended to and taken as a guide, and if the administration be stopped when the patient is fully anæsthetised; and 2, that the sudden falls of pressure, which the Glasgow Committee asserted, are dangerous, and attributed to chloroform, are due to stimulation of the vagus, and, by slowing the circulation, are a safeguard against overdoing.

The Commission further proved that all irregularities in the fall of the blood pressure, and in the circulation under chloroform, including such an irregularity as dilatation of the heart, which occurs when chloroform is administered properly, are due to improper administration with irregular breathing and insufficient air (page 277). Again (page 278), every medical man ought to be able to give a dose of chloroform with as much precision, as certainly as a dose of morphine, or of any other poison. The practical outcome of the disastrous teachings of the Glasgow Committee, backed up by Professors Wood and MacWilliam, is, that the relief of pain by chloroform is to be handed over to the specialists, who alone are to administer it, though their own declarations and statistics show that they cannot give it with safety. Exactly in proportion as this teaching gains ground, the profession suffers loss in credit, and in pocket, and the advantages which chloroform confers are most seriously restricted and curtailed.

The extensive experiments of the Commission have left the chloroform question in the following condition:

It was not found possible to directly paralyze the heart (of dogs) by chloroform in some 600 administrations. Death from chloroform is due apparently from paralysis of the vaso-motor and respiratory centers—probably one or both of these may be affected. When death occurs, it is the result of an overdose of the drug.

¹ See case in full: *Brit. Med. Jour.* Jan. 21, 1890, p. 1,425.

² *British Medical Journal*, Editorial, June, 1890.

TABULAR STATEMENT SHOWING THE "DEATHS FROM CHLORO-

Date.	No.	Name, Age and Sex.	History.	Nature of Operation.	Anæsthetic and Amount Used.	Apparatus Employed.
.....	1	—, 64, M. ....	.....	Reduct'n of dislocat'n of femur	Chloroform. ....	.....
.....	2	J. F., 36, M. ....	.....	Suture of patella.	Chloroform. 1½ oz.	Inhaler.
.....	3	—, 72, F. ....	.....	Removal of eye.	Chloroform. ....	.....
.....	4	—, 1½ yrs., M. ....	.....	Setting of ankle in splint. . .	Chloroform. ....	.....
July 2, '89. .	5	—, 5, M. ....	.....	Curetting tuberculous sinuses	Chloroform. 1 oz. Had taken it three times previous.	Towel.
June 19, 1889.	6	—, 2, F.	Local spina bifida; good health and robust.	To evacuate tumor.	Chloroform.	Towel.
Sept. 29, 1889.	7	P. B., 68, M.	Stricture of urethra, etc. .	Suprapubic cystotomy.	Chloroform. ....	.....
Nov. 9, 1890. .	8	M. C. Joes, 11, F. ....	.....	Removal of mole from face. .	Chlorof. Very little.	Esmarch inhaler.
Aug. 5, 1890. .	9	—, 16, F.	Tubercular disease of foot.	Upon cuboid bone.	Chloroform, 5-7 5. .	.....
Jan. 10, 1891. .	10	—, 44, F.	Cancer.	For removal.	Ether. ....	.....
.....	11	Albert Bate, 21, M.	Chronic abscess.	For removal.	Ether; had used chlor. and nitrous oxide before at times.	.....
.....	12	—, 41, F. ....	.....	Trachealorrhaphy.	Chloroform.	Inhaler.
Feb., 1891. .	13	E. Vials, 24, F. . .	Lupus of nose. Had had 5 or 6 oper'us under chlor.	To remove.	Chloroform.	Skinner's inhaler.
.....	14	—, 30, F.	Good.	Removal of tumor—face. . .	Chloroform. 2-3 oz. .	.....
.....	15	R. Costa, soldier, 25	Good.	Incision in inguinal region. .	Chlor. About 25 gms.	Esmarch inhaler.
.....	16	Mrs. R., 37, F. . .	None.	Trachealorrhaphy and perineorrhaphy.	Chloroform. Had used two times before. .	Esmarch inhaler.
.....	17	J., 42, F.	Ovarian tumor; emaciat'd. .	.....	Chloroform.	Napkins folded in cone.
Feb. 2, 1890. .	18	E. L. P., 44, F. . .	Cancer of stomach.	Reduction of pylorus.	Ether. 110 c.cm. . .	.....
June 5, 1890. .	19	—, 5 mos. . .	Intestinal obstruction. . .	To explore.	Chloroform. 1½ oz. .	Towel and drop bottle.
Dec. 7, '90 (?)	20	—, 17, M. ....	.....	.....	Chloroform. 6 oz. . .	Wire & lint mask.
Dec. 19, '90 (?)	21	J. C., 46, M.	Contract'n of right elbow-joint, 14 mos. duration, due to burn.	.....	Chloroform, oz. iiss. .	Esmarch inhaler and drop bottle.
April 29, 1890	22	Mrs. —, F. . .	Sensitive teeth.	Extraction of tooth.	Chlor. Had used it a number of times before, once 1 oz. used.	.....
Mar. 27, 1890. .	23	Thomas O., 44, M.	Ulcers of leg, tetanus, lower jaw fixed; convulsive movem't of constrictors of pharynx.	.....	Chloroform. ....	.....
June 18, 1890. .	24	John Q., 52, M. . .	Pulm'ry phthisis, chronic nephritis, tubercular rib; abscess in pect. muscles.	.....	Chlor. Had used before. Ether was contraindicated.	Inhaler.
Nov. 1, 1887. .	25	J. M.	Tumor of face of 4 months. Cirrhosis of liver; murmur over mitral area.	To explore.	Chlor. Had only taken ½ doz. respirations.	Towel.
Nov. 18, 1889. .	26	—, 41, M. . .	Epithelioma of tongue; ulceration, etc. Had been a hard drinker.	The removal of epithelioma.	Chloroform, 2½ oz. . .	.....
.....	27	—, 50, M. . .	Feeble man; curvature of spine 15 years duration; bronchitis, chronic.	Abscess of left thigh.	Chlor. Had used before.	.....
.....	28	—, 65.	Tumor in abdomen.	For above.	Chlor. Anæsthesia incomplete.	.....
Mar. 26, 1890. .	29	—, 56, M. . .	Fracture of thigh.	Mending above.	Chloroform. ....	.....
Mar. 29, 1890. .	30	S. G., 28, M. . .	.....	.....	Ether. ....	.....

FORM AND ETHER SINCE THE HYDERABAD COMMISSION."

Posture	How Long under Influence.	Heart or Resp. Stop First.	Means to Resuscitate.	How Long Continued.	Post-Mortem.	Cause of Death.	Reference.
		Heart.			Heart thin walls	Syncope	Lancet, Lond., 1890, ii, 935.
		Heart.	Usual		Fatty heart	Syncope	Lancet, Lond., 1890, ii, 935.
		Not stated			Fatty heart; 14 oz.	Syncope	St. Bartholomew Hosp. Rep., London, 1890, xxvi (in Statistical Tables), p. 97.
					Heart greatly dilated and hypert. Weight more than that of a 3 yr. child.		St. Bartholomew Hosp. Rep., London, 1890, xxvi (in Statistical Tables), p. 97.
	1½ m.	Resp	Usual. Resp. returned and ceased again.				Med. Rec., N. Y., 1890, xxxvii, 289.
	10 m. not profoundly. 5 moments	Resp	Usual		No cause of death found. Heart normal.		Ibid.
Placed on Oper. table.		"Cyanosis. No pulse." Together.	Usual		None		N. Am. Pract., Chicago, 1891, ii, 463.
			Yes	1½ hours	None		Jour. Am. Med. Assn., Chicago, 1891, xvi, 232.
	Few minutes	Resp	Seemed to excite at end of half hour, but then failed.	1½ hours	Anæmia of brain		L'Union Médicale, Aug. 5, 1890.
	Less than min. Op. not commenced	Heart.	Yes		None	Heart failure	Brit. M. J., Jan. 10, '91.
					Fat. degen. geuerally. Heart 11 oz.	Syncope	Brit. M. J., Oct. 11, '90.
	For 8 minutes	Resp	Usual—Sylvester's	¼ hour	None		Brit. M. J., Dec. 21, '90.
		Resp	Usual		No evidence		
		Resp	Usual		No lesion found		Lancet, Lond., 1890, i, 1149.
	Few inhals	Heart	Usual	2 hours	Congestion of brain, old pleurisy, fibrous pericarditis. Fatty heart; renal congestion.	Paral. of heart	Gior. Med. d. r. esercito, etc., 1891, xxxix, 31-54.
	2 min.	Heart			No results		Daniels' Texas M. J., Austin, 1889-90, v, 248-251.
Dorsal decub.	Few inhals. Died 1½ min. 1½ hours	Heart	Usual		No results of value	Syncope in first stage.	Ibid.
					Nothing notable		Hygiea, Stockholm, 1890, 370-374.
		Heart—almost together.	Usual	35 mins	Lungs congested; heart healthy.	Par. of resp'y & car. centers. i, 1425.	Brit. M. J., Lond., 1890, i, 1425.
	20-22 minutes	Heart	Sylvester's and usual.	½ hour	None	Reflex paral. of heart	Lancet, Lond., 1891, i, 339.
	7 minutes	Heart. Resp. continued 30 secs. after.	Usual		General congestion; heart normal; liver slight, fatty; brain œdematous.		Brit. M. J., Lond., 1891, i, 461.
On back.	60 seconds.	Together	Usual		None	See note 1.	N. Am. J. Homœop., N. Y., 1891, 3, s., vi, 164-167.
	Only partial chlorof.	Heart failure. Cessation of resp.	Artificial, usual, etc. Puncture of heart.				N. Am. Pract., Chicago, 1891, ii, 463.
	Few minutes	Heart	Usual	¾ hour	Heart, soft walls, left vent. empty, hypertrophied; pleura adhes, calcareous nodules both lungs; Peyer's patches, and solitary glands enlarged; tuberculosis second right rib; sinus with apex of right lung; kidney contracted.		N. Am. Pract., Chicago, 1891, ii, 463.
Semi-sitting		Heart	Usual		Tumor was "spiudle-cell sarcoma;" heart 22 oz.; cavities much dilated; mitral cusps thickened; arch aorta atheromatous; liver 82 oz., congested and fatty; kidneys congested and fatty.		Brit. Guiana M. Ann., Demerara, 1890, 103-108.
		See note 2.	Usual	¾ hour	No information to help in the case.	Failure of respiration.	N. Orl. M. and S. J., 1889-90 n. s., xvii, 726.
	Just beyond the struggling stage.	Together	Artificial r. sp.	½ hour	Heart ill-nourished, flabby; contained fluid blood; valves healthy; liver fatty; kidney fatty; brain normal caries and ankylosis 3 and 4 lumbar vert.		Brit. M. J., Lond., 1890, ii, 1890.
	See note 3.	Resp.			Malignant disease of stomach.		Ibid, i, 29.
	Death took place before oper. began.						Med. Rec., N. Y., April 19, 1890.
						Fatty heart	Med. Rec., 1891.

TABULAR STATEMENT, CONTINUED.

Date.	Name, Age and Sex.	History.	Nature of Operation.	Anæsthetic and Amount Used.	Apparatus Employed.
April, 1890.	31 Evans, 39, M. . . .	Lupus.	For lupus.	Chloroform.	Handkerchief. . .
Oct. 25, 1890.	32 Gregory, 49, M. . .	Facial neuralgia. . . .	To relieve.	Chlor., 20 gtt. . . .	Handkerchief. . .
July 12, 1890.	33 Bird, 9, M.	Rupture of eye.	Chloroform.	Chloroform.	Chloroform.
34	— M.	Pneumothorax; had used chloroform before.	To explore.	Chloroform.	Chloroform.
Nov. 10, 1890.	35 Jno. Goulden, 7, M.	Affection of knee. . . .	Amputation.	Chloroform, flüss. . .	Tait's apparatus. .
1890.	36 I. L. S., 28, F. . .	Cystic sarcoma of ovary.	Abdominal Section. . . .	Chloroform, flüss. . .	Tait's apparatus. .
Jan. 26, 1890.	37 I. R., 21, M. . . .	Acute lobar pneumonia; had influenza.	For radical cure of oblique inguinal hernia.	Chlor. (Squibbs). Less than 8 c.cm.	Towel over face. .
Feb. 15, 1890.	38 L. Smith, 22. . . .	Chloroform.	Chloroform.	Chloroform.	Chloroform.
April 24, 1890.	39 G. Galvin, 24. . . .	Chloroform.	Chloroform.	Chloroform.	Chloroform.
May 17, 1890.	40 C. Segol, 27. . . .	Chloroform.	Chloroform.	Chloroform.	Chloroform.
May 19, 1890.	41 C. Gollan, 4. . . .	Chloroform.	Chloroform.	Chloroform.	Chloroform.
Mar. 13, 1891.	42 A. M. W., child. F.	Leucoma of right eye. .	Iridectomy.	Chlor. Took it well. .	Chlor. Took it well. .
Jan. 3, 1891.	43 R. Metrani, 30, F.	Injury to face.	Plastic operation.	Chlor. Not excessive.	Inhaler.

Note 1.—Paralysis of pneumogastric nerve, the direct effect of the chloroform, superinduced by effort at vomiting.
 Note 2.—Respiration failed gradually, at one time stopping, and commenced again after artificial respiration.
 Note 3.—Anæsthesia not complete when operation commenced, and heart and respiration ceased.

The most conclusive statements and experiments are given in the paper of Dr. McWilliam in answer to the strictures and conclusions published by Dr. Lawrie.

In the *Medical Chronicle*,³ January, 1891, Surgeon-Major Lawrie, in an article on the Hyderabad Chloroform Commission, makes some comments on certain results obtained by me in a recent investigation on the action of chloroform and ether published in the *British Medical Journal*, October 11, 18, and 25, 1890.

In my paper I described the frequent occurrence of dilatation of the whole heart under the influence of anæsthetic doses of chloroform. Such dilatation was not due to changes in the pulmonary circuit, or to fall of arterial pressure.

Dr. Lawrie urges that the cardiac dilatation was due to obstruction of the circulation of the lungs, or to this along with a fall in the blood pressure. He says: "The irregularities in the tracings of the Glasgow Committee, and Professor McWilliam's recent bogie of dilatation of the heart, are due to obstruction of circulation in the lungs through interference with, or irregularity of, the respiration." And later. "Obstructed circulation in the lungs, and a rapidly falling blood pressure, are more than enough to account for the dilatation of the whole heart, which occurred in his experiments, and which he wrongly attributed to the direct action of chloroform."

Nor can this hypothesis of Surgeon-Major Lawrie's be briefly and conclusively disposed of. There is an abundance of decisive evidence avail-

able. First, as regards the alleged influence of obstruction of the circulation in the lungs, in causing dilatation of the heart. In my paper, in the *British Medical Journal*, I stated the fact that such an explanation was incompetent to explain the cardiac condition, since the whole organ was dilated in my experiments. Dilatation of the right side of the heart might conceivably (if there were no evidence to the contrary) be accounted for by the pressure of pulmonary obstruction, but dilatation of the left side (*e.g.* the left auricle) could clearly not be accounted for in the same way, since pulmonary obstruction necessarily diminishes in a large measure the flow of the blood into the left auricle, and this part becomes small and collapsed. This seemed so obvious to me, that I did not discuss the matter at any great length.

I shall now state, briefly, some facts in regard to Surgeon-Major Lawrie's hypothesis of obstructed circulation in the lungs:

1. There is no proof whatever of the occurrence of pulmonary obstruction from the administration in mammals of anæsthetic doses of chloroform, sufficiently diluted with air, as was the case in my experiments, the amount of chloroform vapor in the air never exceeding four per cent.

2. On the other hand, there is decisive proof that pulmonary obstruction was not present in my experiments. Obstruction of the circulation would necessarily cause distension of the pulmonary artery as well as, and indeed earlier than, distention of the right heart. The pulmonary

TABULAR STATEMENT, CONTINUED.

Posture.	How Long under Influence.	Heart or Resp. Stop First.	Means to Resuscitate.	How Long Continued.	Post-Mortem.	Cause of Death.	Reference.
			Usual		No evidence	Asphyxia	
			Yes				
		Together	Yes		Heart healthy	Heart failure	Brit. M. J., July 12, '90. Ibid, Oct., 1890.
							Lancet, Lond., 1890, ii, 1113.
	20 minutes	Heart failure	Artificial resp., hypodermics, electricity, etc		No organic disease of the heart recognized before death. No post-mortem.	Heart failure	Private contribution from Dr. Jos. Leedy, Jr., University Hospital, Philadelphia.
	5 minutes	Resp.	Everything, artificial resp.	Some time.	None noted	No assignable cause; one of those cases due to some peculiar idiosyncrasy.	Reps. Surg.-Gen. Mar. Hospital, Washington, 1889-90, xviii, 159.
							New South Wales, Albury Hospital.
							Prince Alfred, New So. Wales.
							Prince Alfred, New So. Wales.
							Prince Alfred, New So. Wales.
		Resp.	Usual	10-15 mins.	Heart normal, empty; pleurisy both lungs; other organs healthy.		Brit. M. J., Lond., 1891, i, 800.
		Heart. Resp. ceased a few seconds after	Usual	1 hour	None	Heart failure.	Indian M. Gaz., Calcutta, 1891, iii, 76.

artery would become large and tense in consequence of the increased peripheral resistance to the outflow of blood from that vessel. Then the increased tension would react upon the right heart and cause distension there also. But in my experiments there was no distension of the pulmonary artery during the administration of chloroform. The vessel did not become distended; it was soft and compressible, and the tension within it was low. It is quite certain, then, that pulmonary obstruction could not have been the cause of the dilatation, even on the right side of the heart.

3. Even if pulmonary obstruction had been present—as was not the case—such obstruction could not have produced the condition which I described, or anything similar to it.

I have on various occasions purposely brought about a condition of pulmonary obstruction by mechanical means with a view to studying the features of this condition. This I did by injecting into one of the great systemic veins some particular substance, *e. g.* lycopodium powder, which would cause embolism of the pulmonary vessels and so obstruct the circulation in the lungs. When such a substance is injected into the vein, it rapidly passes through the right heart into the pulmonary vessels, speedily causing more or less extensive and sudden obstruction of the pulmonary circulation, according to the amount and suddenness of the injection.

The effects resulting from the plugging of the minute pulmonary vessels induced in this way are very noteworthy, and illustrate clearly the consequence of obstruction of the circulation of the lungs. The pulmonary artery swells up and becomes largely distended, while at the same time the vessel feels hard and tense to the touch; the

pressure within the vessel is greatly elevated. The right ventricle, and the right auricle also, partake in the condition of distension, being unable to discharge their contents in the normal fashion in face of the greatly augmented resistance in front. The lungs become pale and anæmic. Meanwhile it is important to observe that the left auricle becomes smaller and collapsed-looking, in consequence of the obstacle offered to the passage of the blood through the lungs. Strong respiratory efforts, with convulsions of the asphyxial type (accompanied by spasmodic contraction of the systemic arteries) supervene in consequence of the stoppage of the respiratory purification of the blood; the medullary centres become violently stimulated by the venous character of the blood. Death speedily follows.

It is unnecessary to enter closely into a comparison, or rather contrast, of the typical illustration of pulmonary obstruction here afforded, and the condition of cardiac dilatation which I have described as occurring under the influence of chloroform. It is obvious that obstruction of the circulation in the lungs produces changes strikingly different from those that result from the action of chloroform; and that the hypothesis of pulmonary obstruction may at once be dismissed as entirely insufficient and inapplicable, as far as explanation of the cardiac dilatation occurring under chloroform is concerned.

Seeing that it is easy to dispose of the question of pulmonary obstruction in regard to the effects of chloroform upon the heart, I shall now advert briefly to the possibility of cardiac dilatation being dependent on a rapidly falling blood pressure, as alleged by Dr. Lawrie.

This is a matter which I carefully considered

in my paper, and in regard to which I was able to state definitely that the cardiac dilatation is not due to a fall of blood pressure. This is conclusively proved by the following facts: 1. Dilatation of the heart does not by any means always run parallel to the fall of pressure which ordinarily results from the administration of chloroform. Sometimes there is a very marked fall of pressure, with little or no dilatation of the heart; while at other times, the heart begins to dilate, before the pressure begins to fall. 2. Moreover, the heart in some instances begins to dilate during the temporary rise of pressure which at times precedes the fall. 3. Further, there may be distinct dilatation of the heart without any change of pressure at all. 4. Lastly, it can easily be shown that a simple fall of pressure, equal in amount to that which ordinarily occurs under chloroform, induced by means which do not directly affect the heart—*e. g.*, section of a vaso motor nerve, hæmorrhage, etc—does not cause dilatation of the organ as chloroform does.

It is clear, then, that the dilatation of the heart brought about by chloroform cannot be due to obstruction of the circulation in the lungs, or to a fall of systemic blood pressure; it must result from a depressing influence exerted by the anæsthetic on the organ, 1, directly; or 2, through the vagus nerves.

Finally, as this depressing influence, leading to dilatation, is readily manipulated after section of both vagi, it is obvious that chloroform must act upon the heart directly. I cannot help feeling that even a comparatively slight amount of actual observation of the features and results of a simple lowering of the blood pressure and of real pulmonary obstruction, would have prevented Surgeon-Major Lawrie from putting forward and adhering to such a hypothesis as I have here discussed—a hypothesis at once insufficient, absolutely untenable, and in conflict with large and somewhat elementary facts in the physiology of the circulation.

RESTORATION AFTER CHLOROFORM ASPHYXIA.

There is no doubt that in India deaths do occur (see case No. 43) from the administration of chloroform, yet we know from the facts stated in our work, that the climate of that region, like that of our Southern States, is favorable to its use as an anæsthetic. Recently there has come to our notice, while in search for facts on the subject of prevention of deaths from chloroform, the following cases and opinions of practical surgeons, which we consider worthy of your most serious attention.

Two cases of chloroform asphyxia were reported by Surgeon-Major Bartholomew and Civil Surgeon Ahmedabad. *a.* A patient aged 31, thin and emaciated, had suffered eight years from vesical calculus. He was operated on and the stone,

weighing 50 ozs., extracted, when it was observed that respiration had ceased. Ether hypodermically and the usual remedies were used without effect, and artificial respiration (Sylvester method) continued for three hours before the patient took a long breath (the heart action, though feeble, had not ceased). Six drachms of chloroform had been given.

A patient aged 18, had had 5 drachms of chloroform given prior to enucleation. After the operation the breathing was observed to have ceased, and the patient could not be roused. Artificial respiration was carried on for one hour, and on giving a galvanic shock, the patient recovered consciousness. Drs. Pechey, Phipson, Banks, Maconachie, Meyer and Collee, all of the Army of India, cited instances in their experience of prolonged chloroform asphyxia, and ultimate recovery by artificial respiration and the galvanic shock. Dr. Meyer stated, that there was a danger of inducing delirium of the heart by the prolonged use of electricity (this is the case when applied too near the heart), and thereby superadding a serious complication which might in itself prove fatal. Frequently patients did not breathe for some time after artificial respiration, because the lungs had had such a large quantity of air thrown in as to do away with the physiological reflex stimulus to the respiratory centre.

We do not in our work advise the use of hypodermics of morphine or atropine before the use of chloroform as an anæsthetic, and would call attention to this case, also, as the surgeon did not employ the galvanic shock, and did not keep up the artificial respiration long enough.

In a discussion which took place in the Paris Society of Surgery, upon a paper⁴ treating of the use of hypodermics of morphine and atropine before the inhalation of chloroform, the author of the paper, M. Regnier, was led to try this method in his practice by the recommendation of M. Dastre, who reported favorable results from its use in animals, and of M. Aubert, a surgeon, who stated that narcosis and awaking were facilitated by the injection of $\frac{1}{4}$ gr. morphine muriate and $\frac{1}{85}$ gr. atropine sulphate fifteen or twenty minutes before the operation, and that inconvenient results were observed but rarely. M. Regnier used this method with a number of patients, until, unfortunately, a fatal accident occurred.

A feeble girl, aged 16, was affected with tubercular disease of the bones of the foot, and, as the lungs presented but a few râles in the apex of one side, he decided to chisel out the cuboid bone. Half an hour before the operation he gave a hypodermic injection of $\frac{1}{2}$ gr. of morphine and $\frac{1}{250}$ gr. of atropine. Anæsthesia was easily induced, and not more than from 5 to 7 fluid drachms of chloroform were required for the

⁴ L'Union Médicale, August 5, 1890.

whole operation, which lasted only a few minutes. About ten minutes after the chloroform had been removed, and while the dressings were being applied, she opened her eyes without speaking, and was then carried to her ward. Three minutes later news was brought that she had ceased breathing. Upon reaching her bed he found the respirations very infrequent. They ceased suddenly as the pulse disappeared, although feeble heart-beats were still heard. The pupil then quickly dilated. Protracted artificial respiration seemed, at the end of half an hour, to excite spontaneous respiration, but this soon failed, although supplemented by ether injection and other measures. Post-mortem examination showed anæmia of the cerebral hemispheres and medulla oblongata.

Death in this case came on very slowly from chloroform intoxication. It was quite remarkable that life could be prolonged for more than twenty minutes by artificial respiration. It was claimed that the chloroform must have been eliminated slowly, and that the elimination was rendered more slow than it would otherwise have been by the influence of the morphine and atropine.

Two members of the Society reported that they had observed, in experiments on dogs, that morphine and atropine given before chloroform, produced no reflex phenomena at the beginning, but rendered much more grave such complications as appeared at the end. In some cases there was quite protracted and severe dyspnoea. In dogs thus treated, very little chloroform was needed; in men more was required. It appeared to be conceded that the method was useful in the laboratory, but not in the clinic, as the chances of intoxication were increased.

Another member who had tried the method, stated that in male patients nothing worthy of note was usually observed; while in female patients, the awaking was much more slow than with chloroform alone. He thought women were more sensitive than men to the influence of atropine. Out of five cases he had lost one patient. The operation was for nephrectomy, and lasted an hour, 15 fluid drachms of chloroform being used. After a short awakening the respiration began to fail, cyanosis appeared, and in spite of all measures, death occurred in an hour and ten minutes.

CONCLUSIONS.

1. During the protracted use of chloroform as an anæsthetic, the blood is changed in character, lowered in pressure, with weakening of the action of the heart and changes in its structure.

2. Dilatation of the heart occurs under the use of chloroform at all stages, on both sides of the heart, while the heart muscle is weakened.

3. Cardiac failure occurred before respiration

in thirteen instances out of forty-three cases of death from chloroform.

4. The depressing influence of chloroform on the heart mechanism is not exerted through the vagus nerves, and section of both vagi does not obviate the weakening and dilating influence of chloroform on the heart.

5. Too many trifling operations are performed under chloroform; its use should be reserved for those cases in which ether, nitrous oxide, or cocaine will not produce the anæsthesia desired.

6. Ether deaths, as a rule, occur in patients of a certain class, usually from obstructed respiration, and occasionally the heart will stop first, as in two of the four cases in our tables.

7. Watch both pulse and respiration, both in chloroform and ether; when the breathing becomes very rapid, danger is near.

These changes are apt to follow the first act of respiration. Chloroform vapor should not be employed over 4 per cent.

RELATIONS OF METEOROLOGICAL CONDITIONS TO THE ORIGIN AND PREVALENCE OF ACUTE DISEASES.

Report of the Standing Committee to the Section on State Medicine of the American Medical Association, May, 1891.

BY N. S. DAVIS, M.D., CHAIRMAN,
OF CHICAGO.

The work originally assigned to your Committee was commenced by its chairman in 1874,¹ and it was prosecuted with more or less activity and success until 1885, since which time it has received less attention.

Reports containing important facts and the results of original investigations were made and published in the volumes of Transactions of the Association for 1875, 1877, 1879, 1881 and 1882, and in THE JOURNAL of the Association, Vol. ii, pp. 85-169.

The leading object of the Committee has been to obtain more exact and reliable knowledge concerning the causes and circumstances that originate, or increase the prevalence of, the various forms of acute disease; by procuring and preserving continuous daily records of all appreciable conditions of the atmosphere, water and soil, and coincident record of the date of the commencement of acute diseases, in localities representing different parts of the country and various climatic conditions. For details of the plan adopted and its practical working, I must refer you to the report made to the Association in 1883, and published in THE JOURNAL, Vol. ii, pp. 85-169, 1884. That report included the results of one year of observation and record of the ozone and hydrogen peroxide in ten or twelve stations, as

¹ See Trans. Amer. Med. Association, Vol. xxv, pp. 105, 106.

indicated by uniform test papers, and in Chicago a complete record of the relative amount of free and albuminoid ammonia for the same period of time, as determined by Professor J. H. Long, of the laboratory of the Northwestern University. These records, in connection with those previously made, enable us to deduce the following propositions:

1. That the indications of the presence of ozone and hydrogen peroxide in the atmosphere vary very much at short distances, being generally increased by high winds, cold dry air, and proximity to large bodies of water, and diminished by still, warm and moist air, and still more in the interior of cities, houses, and densely populated districts.

2. That an appreciable amount of both free and albuminoid ammonia is almost always present in the atmosphere, especially in cities and densely populated districts of country. The albuminoid is much more abundant than the free ammonia, and being chiefly derived from putrefactive changes in animal matter, its relative prevalence is greatest during the autumn and early winter months, and least during the spring and early summer, when it is most actively consumed by growing vegetation.

3. The observations of Prof. Long and others show that putrefactive processes in the presence of moisture favor the production of free ammonia, while with greater dryness, more albuminoid ammonia is liberated, and that both are capable of being carried by atmospheric currents several miles from their source. His experiments, as detailed in the report of 1884, also show that the free and albuminoid ammonia are directly acted upon by the ozone, and their identity destroyed by entering into new combinations or being resolved into ultimate elements.

If these propositions are correct, they point directly to the important fact that whenever we have, coincidentally, an abundance of decomposable animal matter on the earth's surface, a favorable temperature, slow atmospheric currents, a minimum of moisture, and little active vegetable growth, albuminoid ammonia will appear most abundant in the atmosphere; sufficiently so, it would seem, to either become the pabulum for the rapid growth of pathogenic germs, or for the evolution of toxalbumens or ptomaines, and thus aid in explaining the rapidity of development and spread of some important epidemics.

On the other hand, when we have coincidentally, either dry cold air or rapid vegetable growth with rapid atmospheric currents, and frequent fresh falling water, we have increased indications of the presence of the active oxidizers, ozone and hydrogen peroxide, with the minimum of albuminoid ammonia in the atmosphere. The influence of these combinations of atmospheric elements on the prevalence of both endemic and

epidemic diseases, is pretty clearly shown by the recorded observations made in Chicago during the last ten years, particularly in reference to typhoid fever, pneumonia, and epidemic influenza or la grippe.

In speaking of atmospheric and climatic conditions at Chicago, it should be borne in mind that the city is built on nearly level ground, skirted for many miles to the east and northeast by Lake Michigan, and to the west and southwest by a still broader expanse of nearly level, rich prairie country, while the most prevalent winds are from the southwest and northeast. The winter of 1880-81 was characterized by at least the average degree of coldness and other ordinary atmospheric conditions, but was followed late in March, 1881, by an extraordinary fall of snow over a wide district of country. Melting rapidly, it caused unusual floods and thorough saturation of soil during the month of April. But for three months following May 1 there was not enough rainfall to wet the dust in the streets, and only an ordinary average during the months of August and September, while the prevailing winds were from the southwest, and unusually light or slow. This early complete saturation of the soil, followed by protracted dryness, with average summer heat and comparatively slight atmospheric currents, strongly favored the formation of an unusually large amount of albuminoid ammonia, with only occasional traces of ozone. The records of disease and mortality show that early in June attacks of typhoid fever began to be more frequent, and the number increased rapidly through July and August, culminating in September, and then declining to the ordinary average through October and November. During the eight months from May 1 to December 31, 1881, the whole number of deaths from typhoid fever, as reported to the city Health Office, was 527; while the total number reported for the corresponding months of 1880 was 143, and for the same in 1882 was only 235. As the extraordinary prevalence of typhoid fever in 1881 diminished to nearly the average of other years in November and December, attacks of pneumonia began to increase, and culminated in a decided excess above the average in January, 1882, when 122 deaths were recorded from that disease, whereas only 48 had been recorded during the corresponding month of the preceding year. But the most important fluctuations in the prevalence of certain diseases, and coincident extraordinary atmospheric conditions, have been observed during the years 1890 and 1891.

At the annual meeting of the American Medical Association, May, 1890, I had the pleasure of reading a brief paper on the meteorological and other local conditions coincident with the prevalence of epidemic influenza in Chicago during the preceding winter. But as the figures regarding

the prevalence of diseases given in that, were limited to the older twenty-four wards, and included only the two months prior to the appearance of the epidemic and two months after its subsidence, I have taken the liberty of extending my observations regarding the further prevalence of that disease in the same city, and its relations to the prevalence of other diseases of importance. The statistics given in this paper relate to the entire city, with a population, as by the census of 1890, of 1,100,000. The diseases considered will be designated as pneumonia, other acute affections of the respiratory organs, influenza or la grippe, typhoid fever, acute diarrhoeal diseases and sunstroke. The acute diarrhoeal diseases will include cholera infantum, cholera morbus, diarrhoea and dysentery. The following tables have been carefully compiled from the books of the Registrar of Vital Statistics in the Health Office of Chicago, and extend over the entire years 1889, 1890, and the first quarter of 1891. Of course they refer only to deaths, and afford a basis for only a proximate estimate of the number of attacks of each disease.

MORTALITY FOR YEAR 1889.											
Cause of Death.											
Pneumonia	128	111	145	126	83	57	47	44	61	93	107
Other acute respirat'y dis.	157	96	90	91	78	59	50	38	29	68	71
Epidemic influenza	30	21	15	12	16	18	29	64	77	68	68
Typhoid fever	11	5	13	18	21	46	594	459	297	84	42
Acute diarrhoeal diseases.	..	..	..	..	1	1	3	..	2	..	..
Sunstroke (coup soleil).	..	..	..	..	..	..	..	..	..	..	..
Total	4182	..	..	..	..	..	..	..	..	..	..

MORTALITY FOR YEAR 1890.											
Cause of Death.											
Pneumonia	518	295	283	172	166	78	41	59	65	85	123
Other acute respirat'y dis.	330	171	181	122	95	64	40	49	48	79	88
Epidemic influenza	64	37	7	2	1	107	86	115	95	72	67
Typhoid fever	53	136	103	45	82	106	571	455	198	69	22
Acute diarrhoeal diseases.	53	67	31	38	33	119	25	4	1	1	..
Sunstroke . . . . .	..	..	..	..	2	..	..	..	..	..	..
Total	6484	..	..	..	..	..	..	..	..	..	..

Mortality for 1st Quarter 1891.				Total for 1st Quar. '89	Total for 1st Quar. '90	Total for 1st Quar. '91.
Cause of Death.	Jan.	Feb.	Mar.			
Pneumonia	280	233	722	384	1096	1235
Other resp. affections . . .	176	172	344	343	682	692
Epidemic influenza	4	6	155	66	108	165
Typhoid fever	67	61	71	29	292	199
Acute diarrhoeal diseases.	28	42	71	29	151	141
				822	2329	2432

The mortality from the diseases named in the

foregoing tables, as shown for 1889, is very nearly the average ratio of mortality from the same diseases for a series of years. If there is any deviation, it is in a slight excess of mortality from diarrhoeal diseases during the early waves of high temperature in July, accompanied by a few sunstrokes. Taking that year as the standard of average mortality, not only for the year but also for the several seasons of the year, we are enabled to see the marked deviations from that in the table for 1890 and the first quarter of 1891, both as regards the occurrence of the epidemic influenza and its apparent influence on the mortality from other diseases. Thus, while the total mortality in 1889 from pneumonia and other acute diseases of the respiratory organs was 2,106, only one-third of which occurred during the first quarter, *i. e.*, January, February and March, and only one death from the epidemic influenza, which occurred the last week of the year, the total mortality from pneumonia and other acute diseases of the respiratory organs in 1890 was 3,486, more than half of which took place during the first quarter, and for those months was double the mortality from the same diseases the preceding year. Coincidentally, the influenza epidemic that had just shown itself the last week of December, 1889 rapidly culminated in January, 1890, and almost as rapidly declined through February and March, leaving a recognized direct mortality of only 111. The reappearance of this epidemic influenza during the first quarter of 1891, at first mildly, occasioning only four deaths in January and six in February, but suddenly culminating with 155 in March, was accompanied by the same extraordinary mortality from acute diseases of the respiratory organs as in 1890. Thus the table for 1891 shows the mortality from pneumonia in January 280, February 233, and in March 722, while that from other acute diseases of the respiratory organs was for January 176, February 172, and March 344, making the total mortality from these diseases during the first quarter of 1891, 1,927—or 149 more than the unusual mortality of the same month of 1890, and 1,200 more than in 1889, representing the ordinary average. The same influenza epidemic influence was plainly seen, though less exaggerated, on the mortality from typhoid fever and diarrhoeal diseases. Thus, during the first quarter of 1889, the mortality from typhoid fever was only 66, while for 1890 it was 292, and for the same months in 1891 it was 199. And from acute diarrhoeal diseases during the first quarter of 1889 the mortality was 29, for the same period of 1890, 151, and for 1891, 114. After making a fair allowance for increase of population during the past two years and three months, the foregoing figures show that the same etiological conditions that gave rise to the epidemic influenza in the city of Chicago, caused at the same time the

mortality from pneumonia and other acute diseases of the respiratory organs to be more than doubled; from typhoid fever to be trebled; and from diarrhoeal diseases to be increased five-fold.

Etiological Conditions.—In considering the etiological conditions preceding, accompanying, and following the epidemic of the first quarter of 1890, in the paper I read to this Section at the last annual meeting, it was shown that during the time of the epidemic, the water supplied to the inhabitants contained an unsafe amount of free and albuminoid ammonia and of microorganisms. It was also shown that during the month preceding the outbreak of the epidemic, the mean atmospheric temperature was 9° F. above that of the same month of the preceding healthy year, and that of the month during which it reached its climax, the mean temperature was 2.4° F. above that of the same month of the preceding year. It was further shown that during the epidemic and for three months preceding, the atmospheric currents had been light and from the southwest.

An examination of the meteorological conditions as shown by the records of the Signal Service Station in Chicago, develops the fact that, for three months prior to the reappearance of the epidemic in 1891, the prevailing winds were from the southwest, the mean temperature above the average of healthy seasons, with an unusually light precipitation, either in rain or snow, until after the climax of the epidemic influenza had been reached, and evidences of impurities in the water supply remained the same as the preceding year. When the epidemic had reached its climax the prevailing wind changed to the northeast, and an increased precipitation, chiefly in the form of light snow, followed. But on the evening of the 30th of March a copious rainfall occurred, accompanied by thunder and lightning, which was followed by a rapid decline of the epidemic and its associated diseases through the month of April.

It will be seen by our tables, that the epidemic influence that culminated in January, 1890, did not reach its climax until in March, 1891; and still the preceding and accompanying conditions of the atmosphere and water, the two elements common to our whole population, were nearly the same in both seasons. What influence, if any, the extraordinary waves of heat in June and July, 1890, may have had in lessening the vital resistance of the people, and thereby increasing the mortality from the influenza, pneumonia and acute respiratory affections that followed several months later, can only be a subject of conjecture. That the varying degrees of atmospheric heat as characterizing different seasons of the year, and different years, exert a very important influence on the physiological and pathological processes taking place in the living human body, there can be no reasonable doubt. That the influence of this agent is much modified by the coincident

degrees of aqueous vapor or atmospheric moisture, is equally certain. And, as already stated in this and a preceding paper, the varying quantities of organic products in the forms of free and albuminoid ammonia pervading the atmosphere, and their antagonistic elements, ozone and hydrogen peroxide, constitute the additional elements to which we must turn our attention in searching for the active etiological factors in such widespread and rapidly developed epidemics as influenza and dengue. The severe and protracted depressing effect of the essential cause or causes of the recent influenza epidemics, on the functions of the cardiac, vaso motor and ganglionic systems of nerves, coincident with excessive irritant action on the respiratory and digestive organs, is very analogous to the action of some of the ptomaines or toxalbumens. And it is difficult to find any other atmospheric elements than the albuminoid, that could be capable of either conversion directly into toxalbumens, or of becoming pabulum for the rapid propagation of pathogenic microbes.

HYGIENE IN THE RURAL DISTRICTS.

Read in the Section of State Medicine, at the Forty-second Annual Meeting of the American Medical Association, at Washington, D. C., May, 1891.

BY GEO. W. JENKINS, M.D.,
OF KILBOURN CITY, WIS.

To be able to successfully combat all the diseases which flesh is heir to, "is a consummation devoutly to be wished;" but greater is it to be able to point out the hidden and lurking causes of disease, and thereby prevent the ravages it entails upon the human family—often widespread in its effects, and equally disastrous in its results.

Ever since the Lord made "man and breathed into his nostrils the breath of life, and man became a living soul," disease and death have surrounded him at every turn, and it is a lamentable fact that man, left to himself without the direction of superior intelligence, would fall into habits of neglect of necessary cleanliness, thereby bringing disease upon himself and the community in which he resides. So we read in Holy Writ that when the Lord took the children of Israel unto Himself as His chosen people, He gave them directions which would conduce to their continuance as a nation, and their health as individuals, and was careful to show them how to observe the great laws of health. One in particular in Deuteronomy 23: 12, 13, in regard to the disposition of all faecal matter—that it should be carried without the camp and properly disposed of in the earth. Moses was one of the first hygienists on record; and much better would it have been for the human family to-day if his commands had been followed to the letter.

Having had a large experience in the practice

of my profession in the rural districts, I have been impressed with the fact that the people that I have visited have been in a most lamentable state of ignorance of the fundamental principles of right living and hygienic conditions of their surroundings.

One great evil that constantly confronts you in the rural districts is the unwholesome water supply. Too often the water in wells is contaminated by surface water and drainage from the house and barn yards. The well is dug near the kitchen door to be of easy access to the family, and in close proximity to the woodpile, and year after year the well receives the wash water and slops from the kitchen, after first filtering through the chips and *debris* that lie about in the back yard. At first the earth serves as a filter for all impurities which the water contains, before it reaches the well. But after a time the earth becomes so charged with filth by constant filtration that it ceases to dispose of its impurities, and the waste from the kitchen reaches the water in the well in nearly the same condition it left the kitchen maid's hands from the washtub or slop basin.

A few cases to the point will illustrate more fully the truth of the above assertions. They are from a report of cases that I presented to the State Board of Health of Wisconsin.

A family of father, mother and five children, were all more or less sick with a fever induced, as I fully believed, by drinking water which was very much contaminated by drainage from the barn yard. The well was situated between the house and barn, with a gentle slope towards the well. The yard was very foul from the accumulation of the rubbish of years, and the water in the well became impregnated with the filth from this source, until it looked, tasted, and smelt badly. I ascertained from the family that when they moved upon the place the frost was in the ground, and the water, to all appearances, was pure and good. When the frost came out the water began to look and taste badly. Of this water all the family used until I was called to see the mother and daughter who were suffering with a malignant form of diphtheria, attended with great depression of all the vital powers and bloody passages from the bowels. I explained to them the probable cause of their sickness and forbade the further use of the water. They soon began to improve and made a good recovery, after using good water from another source. They continued to use the good water for a time, and then they returned to the use of the water in the contaminated well. The mother very soon came down with exactly the same symptoms as before. The family soon left this farm, and a German who owned it, having a family of eight children, moved upon it. He declared that the water was good and pure, and

that the doctor did not know anything about it. After using the water for a short time, one of the children came down with diphtheria, croupal form, and died in less than a week. After this every member of the family was sick of the same disease, and five of them died in less than ten days from the date of the first attack—nor was there any other cases of diphtheria in that section of the country where it proved as fatal as to this family. Is it reasonable to suppose that the cause of that sickness lay in any other direction than that filthy well? I think not.

Again, during the summer of 1881, I noticed that all the cases of typhoid fever which occurred in a certain village, were in families who obtained their water supply from one particular well. Its water was cold and looked pure. This well stood in the centre of a little square, and in the summer months, cattle and other animals were allowed to stand around its curbing fighting insects and stamping the ground, until a hole was made sufficiently large to catch all the water that was wasted during the drawing of it by the several families. In a short time this collected water in the hole was reeking with filth from the animals, and soaked through the earth into the well. I insisted that the typhoid fever originated from the water in that well, but could not make its patrons believe it contained any impurities, until I proved it to them by actual demonstration. I then ordered the ground dug up around the well down to the rock. The well from the rock to the surface of the earth contained tubing about six inches in diameter. This tubing was firmly fixed, by filling in around it cement and stone to the surface of the earth, thus effectually cutting off all surface drainage. After having the well thoroughly cleaned no more typhoid fever originated from that well, nor has there any cases occurred in that section up to the present date. Many farmers allow their cattle in the same way about their wells, with no thought of the possibility of such results.

During the past year I was called early in December to attend a case of diphtheria, in a section of country where there had been no exposure, and found on looking for the cause that the family had been in the habit of protecting their potatoes in the cellar from the frost by covering them four or five inches deep with forest leaves. On further inquiry I ascertained that these same leaves had been left in the cellar for several years, and as there was no window or outside door, the cellar could not be ventilated. The floor above the cellar was old and poor, and the emanations from the decaying leaves could be distinctly smelled. I ordered the leaves to be removed immediately, door and windows made that the cellar might be thoroughly ventilated, and chloride of lime freely used. That made an end of diphtheria in that family.

How often is it the case when the doctor enters the cellar to ascertain the cause of sickness in any given case, that he finds it poorly ventilated, containing decaying vegetables and decomposing matter of various kinds—and in this same cellar the milk is kept from which their butter is made. As milk forms so large a part of the farmers' diet it should be pure, but most farmers never think that milk can become contaminated by being kept in an atmosphere that is full of the germs of decaying substances.

The truth of the matter is this, that notwithstanding lecture upon lecture, line upon line, and precept upon precept, is given to those whom it is calculated to benefit, little good will result therefrom, unless it is given in a way commensurate to their degree of understanding and ability to receive it.

If the people living in the rural districts of our country could be made to understand the great importance of being enlightened upon this important subject, many lives might be saved and much sickness prevented, but so far as I know, no one has ever suggested any plan by which this great branch of their education might become popular and highly instructive to them. I propose to offer a few suggestions by which that object may be obtained.

My idea to gain that desired end, is, that the physicians of two or more adjoining townships should form themselves into a Hygiene society, to meet at stated times at some farmers' house, and then and there show to all that attend those meetings, the dangers that lie hidden and unsuspected about them.

Let any one member of the Hygiene society be required to report upon some subject connected therewith at any one meeting, which may be fixed by previous announcement, and report fully upon that subject, by the use of tests and other demonstrations as the subject demands, to make it intelligible and instructive to the people.

Of course this will require labor and time of the members composing the Board, but if they can prevent disease, and save life by so doing, they will be richly repaid for all their efforts—life and health are of more value than money.

It is the every day duties that we are called upon to attend to—the little details, and to point out again and again a lurking danger to health and life; it is this faithfulness in little things that accomplishes so much that is lasting and beneficial. Say that these duties are irksome—granted. What duties of the physician are not so, from the time that he begins his professional career until it ends? What is his reward?

We receive it every day in the consciousness of having been the means of preventing disease as well as saving the lives of many; and He whose eyes never slumber will surely reward us according to the motives that have prompted us to perform them.

THE BENEFICENCE OF DISEASE.

Read in the Section of State Medicine, at the Forty-second Annual Meeting of the American Medical Association, Washington, D. C., May 5, 1891.

BY A. N. BELL, A.M., M.D.,
OF BROOKLYN, N. Y.

The first thought which this title suggests to the unreflective mind is, that it is in conflict with the almost universally popular belief that disease is an independent, active principle or entity, the result of sin—a penalty for the transgression of some physiological or sanitary law—which is identified with the punishment of our first parents for partaking of the forbidden fruit; a belief which, logically considered, without any conception of organic structure, would imply that man, as originally constituted, was intended to occupy this world forever.

That disease was unknown in the world before the fall of Adam, is only equally true with the statement that so was all knowledge of the concerns of mankind unknown.

It is not my purpose to analyze the sacred record with regard to such special manifestations and miracles as appear to have been adapted by the Creator to the comprehension of man in his primitive state, or to call in question their design; but to consider disease as an essential condition of life, instituted for a beneficent purpose.

I have so long entertained this belief and have had such frequent opportunities of testing its practical utility, that, to my mind, it now amounts to a thorough conviction.

For illustration: About thirty-five years ago I was called to a very sick child, about eight years old, the daughter of a learned, but exceedingly sensitive clergyman. I found him in the room with the child, walking the floor and wringing his hands, and otherwise giving vent to his feelings by prayer; with frequent appeals to God to know why his dear child should be so stricken. "Oh, my God," he cried, "for what is this affliction sent—what has my darling child done that she should be called upon to suffer," and by various similar expressions greatly disturbing to the patient and agonizing to himself.

I, of course, led him from the room and remonstrated with him, and had to repeat the process several times during the few days next following; but finally succeeded in excluding him altogether, until the child had well nigh recovered and he had become composed.

Some two or three months afterward, the Reverend Father, who, I had learned, was the editor of a church magazine, called upon me and requested me to be kind enough to write out in substance what he had learned from me of the nature of disease, and allow him to publish it. I made a conditional promise, and after a few weeks, I wrote out enough to make half a dozen printed pages, and without caption or signature,

I sent it with a note: "Here is your baby, name it to suit yourself."

It appeared in his next issue under the title of "The Goodness of God Manifest in Disease."

This was in 1857. Three years subsequently I rewrote the article and made it the concluding chapter of a little book called "Knowledge of Living Things," published by Bailliere Brothers, New York, 1860.

What follows, comprises the substance of those articles, in conjunction with more knowledge of the structure of the human organism and continued reflection upon the subject.

Every organized being and every organ and tissue of every such being, even the hairs and nails, and the most minute nerves, after they are lost to view under the most powerful microscope, are now known to be composed and maintained by living cells. Each one of the cells thus incorporated is possessed of an individual life of its own, has a period of development and maturity, possesses the property of reproduction, and dies. Life presents itself in the organism as the sum of these vital unities. It is maintained by the circulation of the blood, which is also for the most part composed of living cells; and the processes of organization and function are sustained, or otherwise, according to the conditions of the blood supply and of the organ or organism to which it is distributed. So that all irregular actions, disturbances and pains which follow, are just as much in accordance with the laws which govern the existence of a single cell, as if the cell relied on its own independent action. And all the changes that take place, whether favorable or unfavorable to the continuance of life, are based upon the same fundamental laws.

The cells exist before the being which they organize, and survive it after the play of its functions has been arrested, inasmuch that the life of the organism, throughout, is the resultant of the life of the cells which constitute it; their individual existence being co-ordinated to subserve a perfectly definite object. When this co-ordination is interfered with, the result is disease. The favorable or unfavorable influences determine whether the already existing parts or cells persist, increase or diminish; whether the conditions necessary to the varied play of the organic functions remain, or whether the machinery of life is arrested by the change or cessation of these conditions.

The organism, like the cells of which it is constituted and by which it is maintained, has a period of development and growth; a period of middle life, in which the functions strive to maintain an unaltered mass; and an epoch of decrease or decline, which is concluded by natural death. It is only in accordance with these conditions that life is embodied.

The world was not made for man alone. His

life is linked with the plants and animals which co-exist with him, and these are the issue of long anticipations and preparations.

Not only the comfort, health and degree of civilization, but the very existence of mankind in any given locality, depends upon the state of the earth, the atmosphere of the earth, the climate of the earth, and the productions of the earth. He is placed in a system where all the changes produced in other objects occur according to a relation existing among the substances changed, and his own organization participates in all these things that surround him. He has been endowed with a degree of intelligence equal to the necessity of determining the relation of these things to his health and life, and what he ought to do for himself is as abundantly indicated by the knowledge of his organization and powers, as the uses of any machine is understood by an acquaintance with its construction.

The nature of the human organism is such that a most intricate connection is established between the organic functions, and this connection has a constant relation to the necessity of harmonizing the functions and keeping them in sympathy with each other.

The constant physical and chemical changes which accompany life depend upon the various reciprocities which are produced by the work of the different parts of the body: The assimilation of what is received, the elimination of that which is useless, and the restoration and maintenance of the organs by which these operations are effected.

We need no reasoning to convince us that an organism so curious and so wonderfully perfect in all its parts as the human body, was designed to continue as long as the material composing it and the conditions to which it is exposed will admit of, and that upon us devolves the duty of giving it that continuance.

The preservation of health is an incumbent duty. We must preserve it in its most perfect state, that in which the powers of the constitution can be most effectually exerted. All the health and strength of which we are capable were intended for use; and any unfitness for the functions of life is a partial death, by a weakening of the compensating powers of the system. The life and activity of every part is merged into such a perfect organism, that all the organs composing it are united together in a bond of mutual dependence, and the complete performance of the entire series of actions, is necessary for the healthy maintenance of any one action. All the functions are so completely bound up in each other, that none of them can be suspended without seriously disturbing or causing the cessation of all the rest. Hence if any one organ is diseased, all the other organs are embarrassed.

We are all so placed that there are very few of

the objects surrounding us which may not be serviceable or hurtful; nor is that service to be obtained or injury avoided otherwise than by an acquaintance with things external, and their relations to our existence. The more exact our knowledge of this kind is, the more we lessen the calamities and add to the comforts of life.

Our knowledge of external things wholly depends upon our sense-perceptions. To our senses we trust directly, and by their cultivation we become acquainted with the relation of external things to health, and gain the power of increasing and varying the facts upon which we rely for guidance.

When the body is in full health and strength, the mind is so far assisted thereby that it can bear a closer and longer application. Apprehension is readier, imagination livelier, the compass of thought is more capable of enlargement, perceptions can be more quickly examined and more exactly compared, and a truer judgment can be formed. We can in all things have a clearer understanding of our relation to external things, of that which is best for us and of what is most for our interest, and thence determine our actions more readily, and persist therein with greater resolution and steadiness.

It is in this way that the soundness of the body is serviceable to the mind—each needs, each helps the other.

But the lifetime of man is perfectly consistent with the temporary existence of the cells of which his body is constituted and his relation to the conditions which surround him. Under the most favorable conditions, parts of his frame that are concerned in development unceasingly accumulate the necessary particles by a process as beautiful and systematic as it is mysterious and sublime; until, ultimately, the growth peculiar to the species and the individual is attained.

At this point the preponderance which before existed in the action of the exhalants over the absorbents, ceases; and all is equality. Ere long his exhalants fall off in their wonted activity; the fluids decrease in quantity; the solids become more rigid; and all those changes supervene which characterize the decline of life.

But death may occur at any period of life, a few only ceasing to live by the effects of age alone. The duration of life varies according to numerous conditions and circumstances: The original constitution of the individual, the habits and occupations of life, locality, and various other causes, some of which, accidental or otherwise, are inappreciable before their fatal effects are encountered.

Latitude, elevation, nature of the soil, degree of cultivation, relative position in regard to mountains, forests, rivers, etc., and general aspect of the neighborhood, all modify the con-

dition of man and prove his adaptability by such effects as serve to make him understand his relations to what is around him.

Man's relation to these things are known by their effects. And with the faculty of reason for his guide in the prosecution of his purpose, he continually risks the consequences of his free agency by fortifying himself against recognized conditions inimical to his health and life, or by boldly setting them at defiance in the irregularities of his conduct.

Disease in all its aspects is no less constant than the physical phenomena of the universe. The more attentively it is studied from the earliest records of it, to the present time, the more evident it appears that not a single one of the many diseases described in ancient or modern times has wholly disappeared, or that a single new one has been discovered. The same and all exist to day, as ever have existed, and with equal liability to assert themselves under the same conditions as their want at any period in their history.

The Divine institution of disease in relation to man's free agency and the qualities of natural phenomena suited to the whole organic world, requires that there should be more or less uncertainty and irregularity in its action. Diversity and dissimilarity are everywhere manifest, and not less so in disease and its results than in the classes, orders, genera and species of the animals and plants; individuals of the same species are not unfrequently very dissimilar.

Disease forms no exception to the Divine arrangement of natural phenomena. The beginning and end of human life are only steps in an eternal existence. Death is the completion of life, but if disease had no other purpose nor end than death, it would be an anomaly in the works of the Creator, as involving an arrangement of vitality without salutary tendencies. Like our own handiwork, which has in itself no provision for repair, we should wear out; labor and sorrow would be the end of all our days; life would be a burden, health beyond hope, and eternity a new creation.

The gratification which the reasoning faculties constantly seek, even if it involve a sacrifice of individual health, discloses truths of universal application. And as man tastes of the delights of intellectual action and gives way to the impulses of his nature to pursue them, he will see in disease a providential mercy to encourage his willing submission to it and to mitigate its severity. As its pains are but temporary, he can find strength to bear them patiently, if not to welcome them in the thought of the enduring good which they are intended to work within him.

The uncertainty of the issue in any disease, however slight in the beginning, is evidence of its merciful object. Were it otherwise, were our

bodies so constituted as never to be sick but unto death, how appalling and hopeless would be the condition of man—hardened in sin, by the deliberate postponement of immortal concerns on account of the certainty of time! But the uncertain duration of, and occasional recovery from, even the most fatal diseases, guards and secures their fitness for the common purpose, and prevents them from being any exception to the Divine arrangement.

But let us go further and suppose disease to be of one kind only, and always fatal at a particular period. Then the case would be much aggravated. A deathbed repentance would be the universal reliance, for while health continued there would be no concern for a future state. Feeling sure of time for the necessary preparation, convenience and necessity would take the place of duty, and the deceptions of weakness and bewilderment, instead of strength and clear perception in the full enjoyment of health and faculties, would determine the chances of eternity.

On the other hand, people sometimes die without the intervention of disease—are suddenly cut off in the full possession of health. But such deaths are rare and exceptions to the general rule. And how would it be if they were the rule instead of the exception? How indescribably dreadful would be the fear of certain sudden death! The whole of life would consist in the dread of impending danger; pleasure would be unexperienced and unknown, and civilization among the things that are not.

Indeed, it is only by the present arrangement of disease that its Divine origin can be appreciated and its beneficence discerned. In any other way it would have no analogy to the diversity everywhere manifest in natural phenomena, nor would it serve the merciful purpose for which it was ordained.

Disease was not instituted simply as the road to death, or it would have been uniform and certain in its course. True happiness consists in the influence of religion, to which the whole of life should be devoted.

That fulness of communion which actuates the most kindly emotions, induces peace, inspires love and waits for heaven, is more or less the fruit of disease. It brings out and nourishes all the finest feelings of human nature. When strength is laid low and man is made to see and feel his dependence upon his fellowman, who that has watched and studied the motions of the faithful physician and seen the sympathy of his full heart overflow, lest through too much confidence in human aid the purpose of God may not be fully accomplished; who has seen this and not felt the benefit of the sick room? Or, again, when the surgeon has to take the responsibility of hazarding the most intense suffering with the least bare hope of relief from impending death; with

what sympathy, what self-denying devotion, the wife, the mother, the sister, the friend, aye, the enemy even, and the most abandoned of mankind, all find their feelings softened under such circumstances. But again: when disease appears in its most appalling aspect, and the heart of the Nation is stirred by the advance of a fatal epidemic on a neglectful community, to keep itself fortified against such an event, but instead, is beset round-about with the most favorable conditions for the reception and propagation of such a disease, and the life of thousands, it may be, is made to depend upon the fortitude of the practical sanitarian who is called upon to defend such a community, until it can be aroused from its sleeping indifference and made to bestir itself by the use of its reason; who that has witnessed such scenes is not ready to confess that it is in mercy and not wrath that God has sent disease into the world?

All conflict with this conclusion is removed by our Lord's blessed answer to the question, "Master, who did sin, this man or his parents, that he was born blind?"

"Neither hath this man sinned nor his parents, but that the works of God should be made manifest in him."

The apparent punishment of Azariah with leprosy for profanity, and of Gehazi for covetousness and falsehood, was in reality a correction in mercy. And in like manner were the punishments of the Israelites.

Disease is nowhere manifest as mere punishment, but as a correction in mercy for the salvation of the soul. Even when it is brought about by our own misconduct, it is consonant with this view, because we are admonished by it to be ready for death.

We are corrected against the imprudence committed for future improvement in *ourselves*, not punished that others may profit by our example, which is the true design of punishment. Moreover, as a general thing, there is no connection between acts performed and disease. Indeed, if this were the case, we should find that the righteous and the wicked could be designated by their relative degree of health, and we should be constantly led to inquire, "Who did sin, this man or his parents?"

It is conclusive that no manner of life can be alleged in justification of disease. From infancy to old age, the innocent and the guilty are alike subject to its uncertainties.

The inherent aversion of man to live for the future, needs a constant monitor.

There is no condition in which we are in so much danger of forgetting that an eternity awaits us, as when we are in the uniform enjoyment of health. The purpose of disease may indeed be disregarded, unheeded; in which case the visitation will be unprofitable, as it was to the Philistines, but its purpose is not on this account al-

tered. A thorough conviction of God's love and merciful providence in all His dispensations is the only adequate proof of a submissive spirit. And the benefit of disease is to be obtained, not by endeavoring to discover why it has been inflicted, but by meek submission to the Divine will.

It is thus that the Creator, having designed man for a higher sphere, has not only given him the capacity of knowledge and virtue, but has instituted disease as a sentinel on the threshold of his future existence.

TUBERCULOSIS AND LEPROSY IN JAPAN. A STUDY IN ETHNOLOGICAL PATHOLOGY.

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For twelve centuries the Japanese world knew no change. Buddhist traditions and doctrines, imported from India, religious laws and superstitions, held absolute sway. Even so far back as the age of Jimmu Tennô (660-585 B. C.), that fabulous first Mikado, who is said to have descended from the Gods, Japan had a theocratic form of government; the sovereign was not obeyed only, but worshiped. In the sixth century A. D., in the reign of the 26th Mikado, Buddhism made its first appearance in the country. It gradually extended its domain and consolidated its position through succeeding reigns, until, at last, the Empress Suiko (593-628 A. D.), recognized and made it the religion of the state. These populations have ever since been ruled by the doctrine of Buddha, and peculiarly moulded by its spirit. The Buddhist philosophy exposes, in its sacred volumes, a sacerdotal system of medicine for the cure of the body and the soul. From those hoary pages, Japanese medicine has been evolved; but ever since the twelfth century of the Christian Era, it has striven for independence, and by slow steps, reached, at last, a state of comparative freedom. For their speculation was never completely enfranchised.

All scientific teaching in Japan bears unmistakably still the religious stamp; as to statutory or civil law, it has never made even an effort to shake off the Buddhist shackles, wherewith it has been bound time out of mind.

The building up of the mental and moral type of the Nation has been the work of many centuries, and such a structure will not fall down at the trumpet-blast of one generation, nor of several generations. The laws here as elsewhere, have fitted themselves to national and individual requirements, and neither the spiritual nor the material constitution of the people can adapt itself, at least not for a long time, to the wants, feelings and aspirations of nations so profoundly different from itself, as those whom it has taken

now for its models and preceptors. It will be a useful preliminary, to devote a few words to the description of this strange society.

There have ever existed, it seems, three classes or castes in Japan, a hereditary nobility, a great middle class and a despised crowd of "Pariahs" and paupers. The nobility is composed mainly of the descendants of five ancient and illustrious families, the Fujiwara founded in 645-649 A. D., the Taira founded in 782-905 A. D., the Minamots founded in 839-880 A. D., the Hojo, a branch of the Taira, and the Ashikaga, a branch of the Minamots. The first three have married and intermarried constantly, even incestuously (through concubinage at least), during many hundred years, and thus kept all the power and wealth in their possession. From these are descended the court—nobles and daimios of the realm, the remains of feudal supremacy, whose power was overthrown only at the beginning of the Meiji era in 1867. The Mikado, or religious head of the Nation at that time, had abolished the Shogunate, or so called temporal power of the Tycoons, which had existed in a direct line for 264 years, having been founded by such members of the hereditary nobility as professed the greatest influence. Close breeding between families of that order has been the rule, and often, that families might not die out, it had been found necessary to recur to adoption. The same law which sanctioned adoption, sanctioned also the transmission of nobiliary rank by that process.

There are now 470 princes and nobles, and only 3,000 direct descendants of the old nobility. There has been 123 reigning Mikados, with one dynasty. In 662-667 A. D. reigned Tenji Tennô, the 38th Mikado, whose son became the head of the renowned family of Fujiwara (Wistaria field), next to that of the Mikado, the oldest family in Japan. In 898-930 A. D., in the reign of one of the "Puppet" Mikados, important and noble families arose who disputed with the Fujiwara family the control of the Mikado. In 931-946 A. D. reigned a child of the house of Taira. The great rôle of this family falls between the period of power of the Fujiwara and that of the Minamots, in the middle of the 12th century; and when that age of splendor expired, the name of the race continued to live in the five Sekké families. The earlier professors of Tsushima and various other daimio families, claimed descent from the Taira. The Minamoto (Chinese genji, source of the spring) becomes prominent in its turn, and gives to the country its greatest and most celebrated heroes, who claim descent from the 52nd Mikado (806-809 A. D.). The office of Shogun, which was overthrown in 1867, became their exclusive property. Thus this family, through all kinds of vicissitudes, had held temporal sway during seven centuries! From the 62nd to the 74th Mikado (947-1108 A. D.), the in-

fluence of the Fujiwara continues. In the time of the 83d Mikado (1188-1198 A.D.), the Taira family power was destroyed, the female members were driven into prostitution, being allowed certain privileges, which have been handed down in that class to the present day. In 1203 A.D. the Hojo family appears, and is represented in the Mikado. This house of Hojo fell in 1333 A.D. In 1338 A.D. the Minamoto are represented in the Mikado. After the fall of the Hojo, the Ashikaga appeared, and for 56 years, there were two dynasties, one ruled by the Ashikaga and the other by the Minamoto. Their wars were called the wars of the Chrysanthemums; (this flower being the symbol of the sun, is emblematical of imperial authority—Nippon, the ancient name of Japan, means origin of the sun). The great Ashikaga died in 1409 A.D., and the power and the influence of the Minamoto, having declined from the time of the 102nd Mikado, gradually died out. In the second half of the 6th century, these families again renewed their supremacy, during the times of Mobunaga (of banished Taira and peasant blood), Hideyoshi (of pure peasant blood, and Iyéyasū (of Minamoto and peasant blood). These three names are the greatest in Japanese history. The Shogunate of Ashikaga ended in 1573 A.D. It remained vacant until 1603 A.D., when the Tokugawa dynasty (a branch of Minamoto) was invested with it through Iyéyasū, and continued till 1867 A.D., when it was forever abolished by the reigning Emperor Mutsuhito (Meek man,) whose mother was of the Fujiwara family through the house of Hujo. This Mikado, the 123rd of his line, has no child of his high born wife. It has therefore become a necessity of State to declare his eldest son by one of his six concubines, a lad now twelve years old, prince and heir to the throne. This ceremony will take place in the coming spring.

The great middle class of the population of Japan comprises the bulk of its people. Hybridity has been the rule with it through various immigration, invasions, wars and the commercial relations. Quatrefages (*Bull. Soc. d'anthrop. de Paris*, 1883, vi, 654) defines the factors of the population as follows:

1. A black element, type negrito, to-day probably quite fusioned.
2. A yellow element, coming probably from China, and always easily recognizable.
3. A white Olino element, representing the population which occupied the Archipelago, at the time of the conquest.
4. A white Indonesian element, which made that conquest, and which is found sometimes in a state of purity, especially among the members of the old nobility.

He makes Indonesian and Polynesian synonymous terms, which represent the same race,

claiming that the superior ethnological element, which peopled Polynesia came from the Malay Archipelago, in other words from Indonesia. This element M. Maget tells us, is found in the part of the Japanese race, that is given to the traffics habitual to coast dwellers; he thus defines the nature of that ethnical element, to which belong the fishermen of Japan, so different from all other elements in the interior.

This Indonesian element is not autochton, according to Quatrefages, but is represented by the conquerors, the tradition about Jimmu Tennô leaving no doubt in the matter. He claims that this Simili-Malay race was not a well defined race, but the result of the fusion of diverse, especially yellow and white elements, which were fusioned under the influence of Islamism. He thinks that the black element in the Japanese hybridity, is clearly negrito, and not Papuan or Polynesian negro, basing his conclusion on the study of the skull made by M. Hamy and himself (*Etude sur les Mincopies*, par M. DeQuatrefages, *Revue d' Anthro. Les Negritos a' Fornié et dans l' Archipel. Malais*, par M. Hamy, *Bull. de la Société d' Anthrop.* vii, *Crania Ethnica*).

Remy (*Bull. Soc. d' Anthrop. de Paris*, r883, p. 908) observes that a blonde Japanese does not live, and he never heard of an albino. The blue iris is as rare as the blonde hairs; it had probably never been seen in the country previous to the advent of the Dutch, for the latter mention that they were called the "blue eyed Dutch." The black hue of hair, pileus and iris, is constant. This uniformity of hue, is, especially, the common tie of all the mixed hybridized races which form the population of Japan. The great majority of the people have a limited pileus development. The hair grows in abundance, but the beard, the hair of the pubis and of the arm pits, are rare, and the rest of the body is glabrous. This stopping of development of the pileus system, makes the Japanese preserve for a long time the appearance of adolescence. The same author states that there is no unique Japanese race, and that the population is a mixture of divers races.

His division of hybrid types is as follows:

1. Type with long face, eyes black, oblique and bridled, nose prominent and aquiline, hair stiff and abundant, beard rare, body glabrous. It is considered to be that of beauty and distinction, and is especially found among the nobility. Women who possess it are highly prized. (Mongol)?

2. Type with broad face, prominent cheekbones, eyes oblique, bridled, small, at the level of the head, nose flattened at the root, often prognathous superior jaw, black and abundant hair, the rest of the body glabrous or poor in hair. (Chinese).

3. Type differing from the two foregoing, by

its regular and horizontal eyes, without bridles, but preserving the broadness of the cheek-bones, the flattened nose, the yellow tint of the skin and the rarity of the hair. (Malay).

4. Type which approaches the European races by the disposition of the features of the face and the abundance of the pileus system. It is that of the Alinos, ancient possessors of the soil, driven to the wall by conquest, and living now in the northern part of the island of Yezo.

5. Finally, a novel element, the European hybrid, who takes as a rule the character of the occidental people, as to the shape of the eyes and the color of hair and iris.

Maget (*Journal d'Anthrop. de Paris*,) recognizes four hybrid races issuing from a dominant race. The Hamabêto (people of the sea-coast) forming the dominant race. It inhabits almost constantly the sea-coast, and is given to maritime occupations. It is a Polynesian race, red, with arched nose, eyes of small obliquity, short, as is everything belonging to the Japanese medium, whether animal or plant.

The hybrids of that race are in order of numbers:

a With the Mandchu-Coreans, more numerous in the regions of Nasa-Kendo, Sanindo and Hokuro-Kudo.

b With the Simili-Malays, more numerous in the island of Kiushiu and in that of Sikok. The race, noble, great (Koua zokou), and small (Chizo-kou), is usually connected with this type. It is the conquering race, and rules to this hour.

c With the Ainos. This branch, frequent in the Ken Akita and the Nambou, does not seem to pass beyond the banks of the Biwa lake. In the north of the island of Nippon, the hybrid Olinio-Polynesians are rarely found apart from the sea-coast.

d With a black population (Negrito Polynesian blacks?) This branch of hybrids, which has only few representants, is distributed with some uniformity among all classes. It is recognizable by the Negroid appearance, the sombre and often blackish hue (the Arab negro hybrid tint of Algiers), the curling of the hair or their repeated undulations, the gracility of the calf which is very developed in the autochton (?) race, finally the relative smallness of the stature. (Mr. Maget describes and figures patches and points of black pigment which appear pretty frequently in the sclerotica of all the Japanese races. He sees in these spots an atavic trace of an ancient mixture of negro blood.)

These hybrids have not, in the country, any fixed point of concentration.

Pfoufou (Transactions of the Asiatic Society of Japan) says: "The Japanese were never a conquered nation; immigrations peaceably occurred by several different routes (the Malay Archipelago, Corea, Kamschatka and China);

they bore a prominent part as a nation in the wars of the Indian Princes on the Malay peninsula, and thus fell in with the Arabs, who, before the sixth century, had gained a foothold in China. With them they voyaged to India and Africa. He observes also that there are many different types of men in various localities of Japan.

Brinton says: "The population of Japan is distinctly of mixed origin. The Mongolian and perhaps the Negrito, united with the Aino to produce it. And of what affiliation is the Aino? We cannot say. The Negrito or Eta people are, I believe, the primitive inhabitants of Indonesia, the Malays, etc., later arrivals. Whether these blacks reached Japan, or even Formosa, is rather doubtful, though some have argued in favor of it." He further says: "I am persuaded that island life exerts a more rapid influence, both on physical and linguistic traits, than continental life."

Faulds (Nine years in Japan) observes: "Regarding the affinities of the Japanese, we have no certain knowledge. They are 'Mongrels.' Excluding the Ainos, they are a great ethnic fusion to be further studied. They claim to have descended from heaven, and I hope they may all get back there again."

In our third great division of the people, are included the vast hordes of "Pariahs," the paupers, beggars, and lepers of Japan.

Originally, as is supposed, this class consisted of the Eta, the despised negroid element of the Japanese. The Emperor Tennu Tennô (672-686 A.D.), issued an edict against the use of animal food, which had previously been restricted at the first appearance of Buddhism in the country. This edict was probably instigated by the Priests, whose creed especially forbade the taking of life. Hence tanners, curriers and all leather workers, became "Pariahs." The Eta alone, the original "Pariahs," earned their living by working in skins, and converting them into leather. They also gathered lamprey or loach, which they sold on the bridges, about the moats and canals, which pious Buddhists would purchase, and liberate, by throwing them over the parapet into the water. This act of devotion was called Hojoji, and the Eta, in their capacity of beggars, would offer up prayers for the welfare of their extraordinary patrons. The Japanese Encyclopædia (San-Sai-Dzu-Yé) explains that "the Eta were originally 'Etori,' or attendants, who killed animals required for feeding the Imperial falcons. The Buddhist priests interdicted this unfortunate people's sharing fire and shelter with the rest of the population, and thus the Eta came to constitute a separate race," and thus, possibly, they were subsequently refused privileges of intermixture with the various immigrations that contributed to produce national

hybridity. The "Hinins" (not human) were a class of paupers after the commencement of the Tokugawa dynasty (1603 A. D.). They were allowed to squat on waste lands, to build huts, and gained a livelihood by begging. They were employed to carry away dead bodies from the execution grounds. All of these sub-classes, Eta, "Hinins," "Pariah," beggar, have always been the associates of lepers, and are the more utterly despised. As I have stated elsewhere (*Leprosy in Japan—Intermediary—host function in its propagation. Cutaneous and Genito-Urinary Journal*, 1890), when leprosy attacked a member of a family, he at once strayed away, before his neighbors could know of his misfortune, and wandered, in beggar disguise, to some distant part of the Empire, that he might hide himself among the Eta. This was done, that the other members of his family might not become socially ostracised, or be refused marriage and communion by the neighbors, leprous taint, in bride or groom, being an absolute barrier to union. All beggars, therefore, were outcasts; they could neither eat nor sleep in any man's house, but only under trees, or in abandoned sheds. A dish that was once passed in alms to a beggar, was afterward destroyed, and the vessel from which he had drunk, was not used again. Should he wash himself, perchance, at a well or public watering place, that water became, in public estimation, polluted. Hence the mendicants and despised classes, were forced to make use of streams, rivers and pools; and these were in consequence avoided by the more fortunate.

There are in Japan, according to estimate, 3,000,000 Eta, all, more or less, destitute. They officiate at executions of criminals, burials of dead bodies, and Buddhist cremation ceremonies. Griffis (*The Mikado's Empire*) very graphically refers to them, in his relation of a visit to the Crematorium at Fukui: "On the other side I saw a great heap of skulls, bones, clothes, bowls, utensils and other relics of the dead. It was the monument of a famine, which ravaged Echizen some forty years ago, and during which the poor and the beggars died in such numbers, that they could not be consumed or inhumed in the usual manner, that is, singly, but were cremated by scores, on heaps of brush wood. Near the house was a mound, containing many thousand cubic feet of ashes and calcined bones, the refuse, incineration of the furnaces during many generations. It was "ashes to ashes" instead of "dust to dust."

As for the living "beggars" to be met with in Japan, he says: "We cannot understand their chabu, komarimasu tempo, danna-san, dozo (please, sir, a penny, we are in great need of food), but we comprehend the object of their importunity. They are loathsome, dirty, ragged, sore. Now I wish I were a physician, to heal such

vileness and suffering. Who would care to do an artist's or a poet's work when the noblest of healing needs to be practiced? The children run after us. The old beggars live in straw-kennels, by the road-side, some are naked, except dirty mats bound around them. The law of Japan does not recognize them as human, they are beasts! The man who kills them will be neither punished nor prosecuted. There lies one dead in the road. No! can it be? Yes, there is a dead beggar! and he will lie unburied, perhaps for days, if the dogs do not save the work from the coroner (?). 'And the beggar died;' will he be carried to Abraham's bosom?" These three classes have, during many centuries, lived very much apart from each other. Yet their alimentation was not so different as such a state of things would lead us to suppose; indeed, it has almost been nearly identical through the whole of Japanese society. The climatic influence was the same for all. They have been exactly in the same degree exempt from certain European diseases: puerperal fever, scarlet fever, diphtheria, endemic measles, etc. (in Japan measles occurs epidemically and at long intervals. I saw none. In 1876 and in 1882 separate epidemics occurred). It seems strange, therefore, the conditions being so equal, that the two great diseases, tuberculosis and leprosy, should be almost monopolies of special classes. Tuberculosis is the scourge of the aristocracy, the closely in-bred race of Japan.

Not that it spares the rest of the nation by any means; but it is to the lower classes singularly more merciful. In the high and inbred race the tubercular disposition, tainting and modifying every other disease, is really destructive, so much so that many strains of noble blood would have been extinguished long ago, but for the laws providing for the substitution of heirs. And this tainted tubercular race is a standing menace to the nation's blood, constantly inoculating it through concubinage. In strong contrast with this aristocratic pestilence, leprosy is the disease of our third class, the great crowd of pariahs and paupers. Between these two orders of Japanese society, afflicted each with its own peculiar malady, is situated the great middle class, a hybrid multitude, with no customs of close intermarriage, with active avocations; they are between the drones of high and low life, the workers of Japan. The privileged position of the upper class in regard to leprosy, I am disposed to consider as a fact, partly from personal observation, partly from information derived from native colleagues. In this conclusion I am corroborated by the testimony of foreigners also. Baelz (*Beiträge zur Lehre von der Lepra*, Tokio, Japan, 1885), treating of the matter, says: "A leper belonging to the upper classes I have never seen; one meets, however, as Dr. Miyake assures me, sometimes very rich lepers. For, in deference to hoary Jap-

anese tradition, marriage with members of leprous families is discountenanced, while the lepers intermarry unrestrainedly among themselves. As they are loath to be seen, they retire among their own people, and try, by the acquisition of wealth, to obtain at least such comforts of life as can be got for money. However, these are rare exceptions; most lepers are in wretched circumstances, and many of them subsist miserably on the proceeds of mendicancy upon the high roads or around the outskirts of popular places of pilgrimage. If we believe some Japanese data, the much despised and severely shunned class of the Eta suffers much more frequently from leprosy than the rest of the population." The same writer further observes: "That a manner of living, at variance with the laws of health, favors the eruption of the disease, is admitted unhesitatingly by all observers. The more wretchedly men live in the leprous countries, the more readily they fall a prey to the scourge. We have mentioned before the frequency of leprosy among the Japanese pariahs, the Eta, who, up to quite recent times, used to live in isolated hamlets, and with whom no man held any intercourse—a vessel they had used, anything that had been touched by them, was polluted. Nothing positive is known as to the origin of the Eta and the motive of their isolation. I think it probable that they are the descendants of leper colonies. A circumstance which points very decidedly in that direction, is that the idea of uncleanness, as the Hindoos conceive it, in regard to the lower classes, is quite foreign to Japanese conceptions."

Wernich (*Ueber die Ätiologie, das Erlöschen und die hygienische Bekämpfung des Aussatzes*, Tokio, Japan, 1879) says: "If we turn to the conditions to which a hereditarily disposed individual, born in a climate which influences unfavorably the activities of the skin, is further subject, we cannot omit to cast a glance, in the first instance, on *race and nationality*. There could, of course, be no objection to our treating of the relations of races also, in the section where we speak of the heredity of leprosy. However, it will appear that the conditions of development contained in the race type, are less important for the production of leprosy, than those which touch immediately the vital relations. The disease, as well in Africa as in the Western hemisphere, is much more frequent *among the colored races* than among the white. In the East Indies, where the European residents fall very seldom a prey to it, all indigenous colored races are equally threatened by it; especially the Eurasians (the Anglo-Indian hybrids) furnish their very considerable contingent. In Southern Africa, the Hottentots are most involved, the Negroes follow, the whites are the most leniently treated. However, the supposable immunity of the European ceases, as soon as he lives in countries where the disease is at

home. These circumstances suggest, for this point too, a taking into account of the skin system. That the latter is more disposed to disturbances of nutrition, more vulnerable, *in colored races*, is already made probable by the pigmental element, and it is approximately proved by the immense frequency and variety of the skin diseases to which *all colored races* are liable. But the acquired disposition of the European, which we have mentioned, finds also on this ground its most natural explanation. The violent alterations to which the skin of the European is exposed through profuse sudoral excretion, through the heat-rashes, through melasmata and general discoloration of the complexion, can, after a long time and accumulation, very well be designated as directly destroying influences. True, they display special vigor only then, when the European has to do without the preservatives which his *a priori* privileged position in foreign parts secures for him—when he must, as regards his social position, his life comforts, the care of his health, un-Europeanize himself. The troubles and injuries which present themselves to view in this connection, are, for the etiology of leprosy, of different value. *Much the greatest part of the leprous cases belong undoubtedly to the lowest and poorest layers of society.* If against this it is asserted that there is in Europe, in every country of it, an unleprous proletariat, exposed to all the injuries which hurt the body, and the skin especially, some grounds for the belief in the amendment of the general conditions of the lower classes will be found, nevertheless, when we shall examine the extinction of leprosy. High prelates, princes, crowned heads, were attacked with leprosy in former centuries; certainly those did not suffer most of the evils under which the lower classes are laboring. To the description of squalid misery, prevailing in some regions in Italy, Portugal, Spain, etc., has been opposed the fact, that some neighboring leprosy-free villages and communities present nearly the same wretched conditions of life. But these objections lose much of their weight, if we keep in mind that the eruption of leprosy results surely from a concurrence of various causes, that a life passed in ease is probably not sufficient to obviate the consequences of a decided hereditary tendency in all cases. The majority of the cases of the high-placed rich lepers become preëminently clear, by a certain *modus* of acquiring the disease. While giving due weight to the objections made, we retain here the fact, *that the habits of life of the richer classes are generally a protection against leprosy, while the habits of life of the lower classes provoke the disease.*"

The portion of the lower class which bears the largest burden of leprosy—which is, so to speak, a vast human sewer, cleansing the upper regions of the nation, is scattered over the whole Japanese world. While the noblesse has been stag-

ating for ages, the lower set have been indefatigable wanderers upon the face of the Empire; friendless, lawless, starving, without shelter. In his social solitude, separated from all those offices of kindness and legislation which society affords to the other classes, they were reached by the Buddhist religion, comforted, fed, controlled and administered by it. Under the influence of that creed arose the whole system of customs and traditions governing leprosy. The all-pervading salutary rule of the Buddhist religion is illustrated in the following legend: Chiba-Ken, in the south of the Empire, is a sort of Mecca for the lepers. In many of the story-books we find related that, over a thousand years ago, there lived in that place a youth, twenty-one years old, who was stricken with the popular disease. He was loathsome to behold, and his physical condition repelled all his friends. In this sad plight, he dragged himself to the Temple of Naruba-Fudo, asking to be relieved from his horrible distress; and, to show his good faith, said that he would abstain from food for twenty-one days. After the expiration of twenty days, and in the middle of the twenty-first, Fudo appeared in the flesh to him, and graciously kissed the poison from his sores. Thus was the young man's health restored. The relief was so overpowering, that the quondam leper thought that he must be on the threshold of Nirvana; his rapture was so great, the feeling of gratitude so strong, that he resolved to do nothing but good henceforth. So he became a Buddhist anchorite, and eventually a shining light in the church. Fudo is said to be a double being, a combination of God and Buddha, and is represented, in many temples, with three faces and a body standing, phoenix-like, in the middle of a blazing fire (showing him to be the representant of a divine element of purification, for fire is to them the emblem of purity).

In the province of Sanuki, situated on a peninsula about 700 miles south of Yedo, we find a great multitude of these pariahs and lepers, the Japanese generally believing that the lepers who betake themselves to the immediate protection of Kon-pira, whose shrine is there, will be cured through his tender mercy. This superior being is at the same time God and Buddha. The climate of Sanuki is remarkable by its mildness and amenity, the province being nearly encircled by the sea. Almost all the lepers in the Empire, at some time of their lives, gravitate toward that holy region, and make there a stay of more or less duration. It was a medical teaching of the Buddhists, that a leper should not remain stationary in the place in which the disease had originated. Hence the roamings and disappearances of lepers. Most of the leper laws of Japan are Buddhist traditions, as unchangeable as the laws of the Medes and Persians. The Japanese firmly believe in Kon-pira's power to cure lepro-

sy, and to this popular belief, as well as to some others of Buddhist origin, is due the segregation, and, to some slight extent, isolation, of this wretched multitude. He is, in the Roman Catholic sense, the patron of lepers; he takes care of them in every way. If a leper is robbed in Sanuki, he will compel the thief to restore his booty.

It is estimated that there are in Japan over a hundred thousand lepers and suspected lepers, mostly in the southern part of the empire, but distributed in various proportions over the whole country. There is no belief whatever in its contagiousness, nor in its sexual infection. Whence it came and how it originated no one pretends to know, although it is so common in the southern provinces, where syphilis also is rampant, and the temperament of the population lascivious in the extreme; yet the medical mind of Japan—that is, her physicians and priests—has not been led by this simultaneous presence to admit a congenial nature of the two diseases; on the contrary, they deny it most decidedly, and the proportions in which both diseases affect the different classes bear out their conclusion, for syphilis is more frequent in the middle classes than tuberculosis or leprosy.

The leper class of Japan is not the product of heredity, as their traditional class segregation of outcasts would have operated to destroy the taint; for it is generally recognized, at least in Japan, that the disease exhausts itself after five generations.

Let us pass now from the disease which squalid misery fosters among the poorest of the nation to its aristocratic rival, which the inbreeding of the upper classes favors in a different, though little less disastrous manner.

Remy, in *Arch. Gen. de Médecine*, makes the following statement: "Tuberculosis is not rare in Tokio (Yedo) and Yokohama; as usual, it is more frequent in the city than in the country, and, among the denizens of cities, it affects especially certain classes—*people who have no muscular exercise—the nobility*, the merchants, all who are given to study or have a sedentary profession. There exists between the inhabitants of the country and those of the city a difference similar to that which exists in our own countries. The former owe to the labors of agriculture a more complete muscular development. They are broader, more massively built. In Japan the tilling of the soil is entirely done by man's hand; the beast of burden is little used. It is man who breaks the glebe, carries the burdens, drags the loads. It is the same in the city with laborers. They are strong and muscular; but some of them have begun to indulge in drunkenness, and to get intoxicated with the rice brandy, the saké.

The city man is of weak constitution, and has attenuated limbs. He often lacks every bodily

exercise. Gymnastics, games, equitation, are not valued. The nobles have given up their practice of arms. The merchant, in his wide, open shop, the student in his chamber, remain motionless for hours. Nutrition, in consequence, is badly performed, and in winter the heating of the apartments is quite insufficient. A few coals in the middle of a vessel filled with ashes, the 'hibatchi,' or brasers, is the only system known. Insufficient in a space enclosed to the extent of two-thirds of its periphery by slight wooden frames, which are covered with translucent paper, this 'hibatchi' is perfectly useless in a shop, constantly open in all the breadth of its façade. The poor merchants crouching over their 'hibatchi,' their hands extended over the coals, offer a spectacle truly pitiful. Their clothing itself is little calculated to protect them against the cold. It consists, for both sexes, of dresses open in front and tightened around the waist by a girdle. The shirt is used by those who have come in contact with Europeans, and even by them seldom. A simple piece of stuff goes around the loins and extends to the middle of the thigh. Buttons are unknown; so that the dress, simply crossed and kept in place by the girdle, leaves uncovered the upper part of the chest, and leaves bare the legs also at every motion. The men wear sometimes cotton drawers, or tight breeches of blue linen. In the country, women wear a similar kind of inexpressibles, which makes them look like men; but in the cities, the legs of women remain uncovered. A simple, small linen sock covers the foot up to the ankle. Moreover, the air penetrates to the skin through the large orifices of the sleeves. To this inadequacy of defensive armor against the cold must be attributed the frequency of the pulmonary affections, bronchitis, pleurisy, catarrh. However, in Tokio, pneumonia is comparatively infrequent, even among laborers. As to tuberculosis, it must be referred to as complexity of causes: the insufficiency of bodily exercise, of the heating, a diet often too scanty, often excess in pleasures, to which the Japanese are uncommonly prone; finally, scrofula (?) and hereditary disposition. However, I am of opinion that there exists among the adults a good deal of acquired phthisis. The tuberculosis potatorum is almost unknown. There is only one alcoholic beverage in general use, the saké, or rice brandy; it induces intoxication rapidly, but as its daily use is not common, there are but few drunkards.

Tuberculosis, then, is either hereditary or acquired. It affects every age, children, adolescents, mature men. I have often seen it start with the left side of the lungs, as it is observed to do in the tuberculosis incident on sedentary avocations. Here are some particulars: it begins sometimes with exudatory peritonitis, whose products are resorbed, as in pleurisy. It is less

frequently accompanied by digestive disturbances. The ingestion of the saké causes almost always abundant hæmoptysis."

Wernich (*Infections Krankheiten der Japanesen*, Tokio, Japan, 1878) speaks of the enormous frequency of tuberculosis in the Japanese islands. "The most important atmospheric element for its favorable course," he says, "is the low degree of atmospheric humidity. Next to dryness, uniformity of temperature must be considered as the most important element to secure rarity and a relatively better course of the diseased phenomena. A uniformly low temperature is, in this respect, to be preferred to a uniformly high one. After comparing these conditions with the element represented by the Japanese climate, it will not seem strange that in our about 2,200 cases, tuberculosis alone was represented by one-seventh, 325."

In speaking of the course of the disease, as exhibited to him in these cases, he points out the frequency and abundance of the blood effusions in them, *exceeding all limits known to him*. "In the freshly observed cases appeared the very remarkable symptom of a dark red coloration of the sputa, enduring for weeks, sometimes amounting to a regular hæmoptysis, *without any bad results ensuing*."

Herein Wernich evidently counts his cases of distoma pulmonale (Ringeri) with consumption. His percentage of ordinary middle class tuberculous cases would be otherwise excessive.

Baelz (loc. cit.) says: "The analogy between leprosy and tuberculosis, which we have repeatedly pointed out, is important enough to warrant a little more consideration. The bacilli of both diseases are distinguished by quite a number of common peculiarities, which differentiate them from other bacilli. Both diseases are probably contagious, but in a very feeble degree. In both the danger of infection diminishes in good hygienic conditions. Leprosy has a great deal of similarity with skin tuberculosis. Leprosy and ulcerous tuberculosis of the lungs affect seldom children previous to puberty.

At any rate, the two diseases must be considered as congeners, and it would not be without interest to examine whether there does not exist between them such a relation, *that in countries or in classes, where the one is frequent, the other is proportionally scarce*. As far as my knowledge of the literature enables me to judge, tuberculosis hardly appears to have played formerly the same part which unfortunately it does in our day."

He further remarks: "It is with tuberculosis that leprosy has the greatest analogies. Although every physician will concede now-a-days that tuberculosis is transmissible, experience shows, on the other hand, that for a large majority of mankind such a danger does not exist, in spite of most intimate intercourse. In order that a

man be affected with tuberculosis, the presence, and even the reception, of the bacilli is not sufficient, otherwise every physician and every nurse would be tuberculous. The point is, that the bacilli find a *proper soil for their nutrition*; and *this favorable soil consists in a mostly hereditary weakness of the tissues*. In a strong man, the cell devours the bacillus; in a weak subject, the bacillus devours the cell.

In this sense, *heredity is still of the greatest influence in the origination of consumption*."

I came myself for the first time in contact with Japanese tuberculosis in 1873. I was then called from Philadelphia to attend Prince Adzuma, a brother of the Mikado, who, under an assumed name, had been studying at the United States Naval Academy, at Annapolis. He had been seized with a hæmorrhage of the lungs, and was removed to Wormley's Hotel, Washington. Dr. J. P. Lincoln, in consultation, after the incipency of tubercle had been determined, advised the transfer of the patient to New York, for examination by the elder Flint, who directed his removal to his native country. I afterward saw him at his home in Yedo, and found that the disease had steadily progressed. He died in the following year. It has been my experience among the Japanese to find this disease most active among those people who take the least exercise—the higher classes, the nobles, the rich, the studious, and those given to the vices of high life. That, as we ascend the social scale of Japan, the general weakness of the constitution increases will be made evident, I think, by the well established fact that the court nobles and daimios do not produce much offspring. While, in the middle classes, four children to one mother is the average, in the daimios' class, one is the rule. This scarceness of progeny cannot, by any means, be ascribed to a want of sexual appetite. The Japanese are an amative race, and the Yoshiwara or prostitute system had to be instituted to restrain the passions of the Shizoku, or military nobility (the order next in rank to the hereditary nobility). Neither Shintoïsm nor Buddhism had proved adequate to the task of keeping them in bounds. Hence, public morality had to make concessions, and society gave its countenance and approval to the marital union between the presentants of society and those of that same Yoshiwara. It came thus to pass quite naturally that mothers sold their daughters to the brothels in order to give them a chance in life! Their sexual perversities are many. Pederasty and other unnatural vices are as common as in any country of Asia. In the northern portion of Japan, Mutsu, composed of several noted provinces, and in famous Satsuma, in the south, there especially the "Millstone of Orientalism" hangs round the neck of Japan. The love of "bichon" (fine boys) is a part of the aristocratic tra-

dition. The last great insurrection in Japan was notoriously complicated by the jealousies of two statesmen about a beautiful youth. These vices have helped to weaken the race.

Maclay (Budget of Japanese notes), speaking of the daimio of Hirosaki Castle, says: "During the hot summer months, when the exhalations from the moat render the immediate vicinity unhealthy, he will journey off to his mountain villa, where he can spend a month or two in composing Chinese poetry in honor of the moon or his favorite concubine. About three or four times in season he will exert himself sufficiently to visit some hot mineral springs in the mountains, to soak out the licentious impurities of a past winter." And, speaking of the Samurai, or military nobility, not included in the hereditary nobility, but who are attendants on it, he says: "The truth is, about Perry's time, political affairs in Japan had become thoroughly run down. These Samurai were rapidly degenerating into a herd of voluptuous imbeciles. Licentiousness abounded in private life."

We can clearly see now, how this excessive inbreeding of an originally finely bred race, through so many generations, added to a luxurious life, in which every wish was gratified, and vice fostered in an unusual degree, the existence of a pampered aristocracy, obeyed and corrupted by that servile military order, always cringingly at its beck and call, until it had almost sunk into imbecility—how these conditions worked together to bring about the disposition to the disease, the tubercular soil. The whole order has thus become eminently susceptible to this special disease.

Holmes (origin of the Infectious Diseases, Jour. Am. Med. Assoc. 1890), says, regarding the bacillus of tuberculosis: It appears that it is unable to grow on any accidental or artificial media, under any presumptuous natural conditions of temperature and external surroundings. It is able to multiply in man and in some other mammals, and in a few related vertebrates. Therefore, we may presume that, should it be deprived of a living host, even a day beyond the few months during which its spores might retain vitality, the species would become wholly extinct, and the world be free ever afterwards from the ravages of this dreadful scourge. The bacillus of tuberculosis is then an obligate parasite of the warm blooded animals. When we consider what specific difference means, and how perfectly the bacillus of tuberculosis manifests this difference, and when we see how great is its geographical distribution, we are compelled to go back far into the present geological epoch, and probably beyond it, for its origin."

He further says: "Looking upon these obligate parasites of man, as of such ancient association, going back beyond the present geological epoch

for the beginning of *syphilis*, *tuberculosis*, *leprosy*, etc., how is it possible that man has been able to withstand the attacks of so many enemies, for so long a time?

The very fact that he has survived, and that these parasites are unable to exist in any other media, than his living body, is conclusive proof that they are not essentially destructive parasites; for with destruction of the host species, occurs the destruction of the obligate parasite. Such a proposition appears to be axiomatic, but axioms occasionally need to be formulated. Given abundant opportunity of contagion, a destructive obligate parasite is inconceivable. It is possible only when its destructiveness does not interfere with the reproduction of the host species, as after the reproductive act has been performed."

And further: "While we are accustomed to look upon *syphilis*, *tuberculosis* and *leprosy*, as excessively destructive diseases, a moment's consideration is enough to clear our minds of this traditional notion. Syphilis, in the strong and healthy Caucasian, frequently runs the first and the second stages of its course, without recognition, and does not, therefore, interfere with procreation. When the infirmities of age confine the patient to unfavorable surroundings and habits of life, the tertiary symptoms come on with the reduced vitality and nutrition. Fatal or destructive syphilis, in the otherwise well and healthy, is rare. In children and in poorly nourished young people, and in those suffering from chronic diseases, it frequently appears as a terminal affection."

"Tuberculosis in the lymph glands of the neck, in the bones and joints, in the ear, and even in the peritoneum, is not very destructive. It is frequently followed by recovery. Even in the lungs, tuberculosis may run a chronic and rather harmless course, and interfere very little with the reproduction of the species. It is only after pyogenic infection of the tubercular tissues of the lungs, or other areas, that sepsis and symptoms of "hectic" appear. This sepsis is then the destructive factor, as it is in wound infection."

"Leprosy is the closest obligate parasite of man, so far observed. The *bacillus of leprosy* bears a remarkable morphological relation and staining reaction to the prime factors of *tuberculosis* and *syphilis*. It is almost never a destructive disease, and it appears only in those who could have already accomplished the reproductive act; therefore it does not interfere with the perpetuation of the species. It is conveyed by contact, but only with difficulty, and there is evidence that it is not necessarily hereditary; that is to say, healthy children may be born of those who are suffering from leprosy. The attendants on persons suffering from leprosy are not often affected with the disease, but often enough to demonstrate its contagiousness(?)."

Finally he remarks: "*Leprosy* conveys no immunity, for the disease rarely terminates in recovery, but the infection is accomplished with the greatest difficulty, and the spread of the disease is slow. *Syphilis* is not very destructive, it has a difficult but certain method of infection, and one attack does not so surely protect against subsequent recurrence. Instances of this kind could easily be multiplied, bringing in other factors, which act in producing immunity, or protection, or physiological resistance. All brought about by the obvious necessities of the law of the survival of the fittest, and that of heredity.

His conclusions are:

1. All obligate parasites are without exception, examples of *very ancient parasitism*, and what is of more practical moment, they are necessarily non-destructive to the host species.

2. The destructive action of the obligate parasites is only manifested toward the weaker individuals of the race, and therefore they are a factor in the evolution of a strong and wise and morally temperate nation.

3. The great field of expectant medicine lies in the treatment of diseases, due to obligate parasites, while the great field of preventive medicine is to be found in providing against infection with facultative parasites.

It is strange that these three obligate parasites of man, dating back probably to a mythical age, should have thus occupied each its own almost exclusive domain in the Japanese nation.

It seems as if the division of this nation, with its varying conditions of conjugality, has exercised a strong influence upon the development of these three diseases, which have so many congenial features.

Whether there is any value in the points which I have here endeavored to elucidate, whether they are of a nature to throw some light upon the portions of ethnical pathology to which they refer, I leave it for the decision of those who are in a position to speak with superior authority on these subjects.

The most important conclusions, I think, to draw from the facts exposed in these pages, are:

1. The close in-breeding of an exclusive class tends to its destruction, through the development of a tubercular soil, or through sterility.

2. Hybridity, as shown by a negative proof in the highest class of Japan, is a requisite for the formation of a healthy race, (with but one exception, represented by negroid element, as in the Eta of Japan); the mixture of races is therefore greatly to be approved of; it is one of the great elements of strength in our American nation.

3. As nature tends to eliminate, by her own occult operation, tubercular and leprous elements, from the healthy mass of the people, our only rational course is to assist her, by *isolating our tubercular patients*, as lepers are isolated in other countries.

ELASTIC LIGATURE IN INTESTINAL ANASTOMOSIS.

BY A. H. CORDIER, M.D.,
OF MCPHERSON, KAN.

There are not many surgeons in this country who have not, at some time within the last three years, done some experimental intestinal surgery, and the number of dogs sacrificed for the "advancement of science" are counted by the thousands. In no other way could this rapid advance have been wrought in so short a period. To Dr. Senn is due the credit of this desire to improve in the technique of intestinal surgery, and the advent of his decalcified bone plates marked a new era in this branch of our healing art.

The many modifications of his plates by eminent surgeons suggest to the reader's mind that something better is desired. The catgut mats and plates of Davis, the segmented rubber rings of Brokaw, and the plates of vegetable tissue of Lawbarn, are a few of the many methods devised by various surgeons, all of which I have used in my experimental work in the last two years.

When we recall the old and tedious method of joining the divided gut end to end, occupying an hour and a half of valuable time, well we may with joy herald the introduction of any operation which will reduce to a minimum the time of performing it, and thus rob the operation of one of its greatest dangers.

At the last meeting of the American Medical Association, the address on surgery was delivered by Dr. T. A. McGraw, of Detroit, selecting as his subject, "Use of the Elastic Ligature in Surgery of the Intestines." On reading the article in THE JOURNAL of the Association (May 16, 1891), I resolved to begin a series of experiments on dogs by this method, as described by Dr. McGraw. I sent to Milburn and Williamson, of Detroit, where the elastic ligature may be obtained at a trifling expense. By the 25th of May I had begun my work. The ligature is about the size of the lead in an ordinary lead pencil, very elastic and stout. By shaving the end of the ligature, it can be threaded on a needle much smaller than itself.

I quote Dr. McGraw's language as it is published—that is, that part of his paper describing the application of the ligature. "This is a decided advantage, for the reason that it is important to make as small a hole as possible through the intestinal wall, and also to have the ligature not only completely fill, but distend the hole, so as to prevent any extravasation of feculent fluid. Now, by stretching the rubber during its passage, rendering it thin and small, it may be easily drawn over the needle, and its subsequent contraction will largely increase its size and cause it to more fully fill the orifice. The ligature was in most cases passed through the gut in its long axis and

at points most distant from the mesenteric attachment. Before passing it the bowels were stitched together by from three to six Lembert sutures, and afterwards similar stitches above the ligature served not only to give additional protection, but also to bury the rubber in the intestinal folds. Usually an inch or more was included in the ligature. After the cord had been drawn through both coils of the intestines, it was tied as tightly as possible in a square knot. Although the knot will ordinarily hold without further fastening, yet, as I wished to cut the ends very short, to cause as little peritoneal inflammation as possible, I always secure the ends so as to make slipping impossible. In tying the ligature, a silk thread is laid under it, first over the first turn of the knot and afterwards over the completed knot—this fastens the rubber against a possible slipping. In making the knot, the ligature should be drawn as tightly as possible without breaking."

In my experiments on fifteen dogs, I did not lose a dog from any cause. Antisepsis was observed as thoroughly as possible. My dogs were killed at various periods after the operations, and the results noted. I found the same condition of the effects of the ligature as described by Dr. McGraw. My dogs, rapidly recovering from the immediate effects of the operation, were up and eating in a few days.

In this short period, and with the very limited experience in doing an intestinal anastomosis by the elastic ligature, I am very favorably impressed with the method, and have made the following deductions:

1. It is an emergency method.
2. The ligature does not swell and produce undue pressure on any other structures than those intended to be cut through.
3. It is not acted upon by the alimentary juices, consequently cannot disappear before its work is completed.
4. It can be used in establishing the lumina of the gut in closing an artificial anus.
5. You do not get needles and threads tangled, as is liable to occur in applying any of the ring or plate devices.
6. Requires less experience and fewer assistants.
7. Does not open the gut until after plastic exudate has sealed the approximated surfaces, thus avoiding one of the greatest dangers in other anastomotic operations.
8. It is quickly performed, saving from fifteen to thirty minutes of valuable time to the patient.
9. The elastic ligature is so pliable and soft that no harm can possibly come from its presence in the intestines.
10. By using the elastic ligature and surrounding it with Lembert sutures, you bring and hold in contact as large or larger surfaces of peritoneum than you can get by any other operation.
11. The opening made is lined by mucous

membrane throughout, thus insuring its patency.

12. You do not produce any hæmorrhage from dividing the vessels of the intestines, as is often the case in using the plates or mats. This bleeding, although easily controlled, takes up some time to check it in many cases.

13. Its use is limited, and may be applied where there is a partial stenosis of the gut, or destruction in part of the intestine which will lead to a stricture if repaired. In the latter condition, the rent may be closed with Lembert sutures or resected, the ends inverted and closed in the usual way, and approximated by this method, and a communication will be established in four or five days.

14. This method finds special indications when an operation for cancer is performed, or for sloughing intussusception or hernia, stricture of any part of the intestinal canal where the obstruction is not complete or of long duration. All cases demanding an immediate relief by establishing the continuity of the canal, or within a period of four or five days, must be operated on by some one of the other methods.

15. Where it is necessary or advisable to make a large or long opening, as in operating on the large intestines, to prevent too much puckering of the walls of the gut, a double ligature can be applied, upon the principle of the "Tait Staffordshire knot," or the chain ligature of Dr. Peaslee, taking care to tie the ligature so the knot will come in the middle of the constricted and approximated surfaces, and is well closed in by Lembert stitches.

I recall one case in the human being in which I applied the approximation mats of catgut for the relief of a traumatic stricture of the ileum, the patient dying from shock a short time after the completion of the operation, I believe in part due to the almost unnecessarily prolonged time occupied in making anastomotic openings, introducing mats, untangling threads, want of more experience and skilled or trained assistants, all combined, taking up much valuable time. With the elastic ligature operation I believe this case would have recovered.

Dr. McGraw, in his able address, has left so little unsaid of his method and its results, that I refer the reader to his article.

I desire to thank Dr. Salthouse and Mr. Tull, a medical student, for valuable assistance rendered while carrying on my experimental work.

IN EVERY case of hysteria, whatever be the condition of the locality giving rise to the special symptoms, there is a pathological condition of the central cortical cells, and to these you must address your attention if you hope for success in the treatment. You cannot afford to scout the idea of disease simply because the peripheral lesion does not correspond to the symptoms existing. Disease just as important and far more troublesome is present, and will require the skill of the most expert for its mastery.—*Lancet Critic.*

SALPINGITIS; WITH A REPORT OF TWO CASES.

Read at the Forty-sixth Annual Meeting of the Ohio State Medical Society, Sandusky, O., June 17, 18, 19, 1891.

BY A. B. WALKER, M.D.,
OF CANTON, OHIO.

It has been but a few years since we have known much regarding diseases of the Fallopian tubes. Thirty-three years ago Bernutz, in his writings, clearly described the pathology of pelvic inflammations. But little advance, however, was made until Mr. Lawson Tait, in 1872, made known his remarkable success in removing diseased tubes by laparotomy.

The writings of Battey, in America, and Hegar, in Germany, on the removal of ovaries for other diseases than that of ovarian tumors had much influence in developing the proper method in treating diseases of the uterine appendages.

It was not until 1882-3 in America that the operation of laparotomy was made for removal of diseased tubes, the first operator being W. Gill Wylie, of New York.

During the years 1883-4 numerous cases were operated upon for salpingitis by gynecologists and surgeons, since which time the operation has been very frequently performed.

Previous to the investigations of such men as Bernutz, Tait, W. Gill Wylie and others, characteristic cases of salpingitis were very common, and went under the name of pelvic cellulitis. W. Gill Wylie claims it was true in this country until before 1882-3, since which time we find pelvic cellulitis to be a rare disease, and very seldom existing except as a phlegmon in puerperal cases.

Many of the cases we formerly looked upon as fresh attacks of old pelvic cellulitis we now find to be local peritonitis due to salpingitis.

Salpingitis does not have its origin in the Fallopian tubes except in rare cases, but is usually the result of extension of disease from the endometrium.

W. Gill Wylie says: "It is difficult to conceive a salpingitis starting up as a primary disease independent of any disease of the uterus or ovaries. It is generally conceded that it is due in almost all cases to the extension of inflammations from the uterus to the Fallopian tubes, and that endometritis, whatever be the cause of it, is liable to result in salpingitis."

According to Wylie's ideas, which are doubtless correct, anything that will cause endometritis may, by extension of the inflammation, produce salpingitis, as gonorrhœa, sepsis after abortion and labor, syphilis, tuberculosis, pessaries (stem in particular), unclean sounds, intra-uterine injections, sponges and other kind of tents.

Salpingitis may also be caused from tubal pregnancy. Anything that obstructs drainage

om the uterus or tube may cause distension of the tubes and result in salpingitis. Salpingitis, it is claimed, accompanies some of the eruptive fevers. Direct extension of inflammation from diseases of the ovaries, as a suppurative dermoid cyst, may cause salpingitis. Pelvic hæmatocele and cancer may also produce salpingitis. Suppressed menstruation from wet feet and cold may set up catarrhal endometritis, and by the narrowing of the cervical canal, which is generally the result of uterine catarrh, the proper drainage from the uterus is prevented, when the catarrhal secretion may be forced into the Fallopian tube or tubes and cause salpingitis. As the mucous membrane lining, the tube takes on the catarrhal form of inflammations, and the secretion becomes excessive—more than is drained off through the uterine end of tube; some of it escapes at its fimbriated extremity into the peritoneum, by which the tube or tubes become closed with adhesive inflammation, when a typical salpinx will follow.

Chilling of the body from eating ices or drinking cold or iced water during menstruation may in like manner set up salpingitis.

As we have learned that salpingitis is such a common condition, it should always be looked for in pelvic inflammations, for it is, in a large majority of cases, the cause of the trouble. A diagnosis, however, is very difficult when in the acute stage. But as the salpinx becomes well developed, it can generally be easily diagnosed after the acute symptoms subside.

The acute attacks women are subjected to who have salpingitis are usually local or pelvic peritonitis caused by septic matter that escapes from the fimbriated extremity of the diseased tubes or from a rupture of the tube. Any woman, then, that is so unfortunate as to have a salpingitis is in constant danger of an attack of peritonitis from the escape of septic fluid into her peritoneum, as we have described.

Catarrhal salpingitis, when the tube is not distended, cannot be made out by the sense of touch. In fact, it is only after adhesions or occlusions of the tubes, and they are distended, that a diagnosis can be made.

The symptoms of salpingitis are frequent attacks of local peritonitis; severe pain one week or ten days before menstruation; relieved after the flow is established. There is a dull, dragging, burning pain over the seat of the tube affected. To the sense of touch, a well-defined tumor can usually be detected by bimanual examination. If it is a hydro-salpinx, the tumor will be conical shape, walls of tube thin and elastic; the local pains and acute symptoms not so severe as in pyosalpinx; when if it is a pyosalpinx, the walls will be thick and inelastic; the tumor club shaped.

Women who have both tubes affected are

always sterile; when but one tube is affected and both ends of diseased tube closed, pregnancy may take place, but an abortion is very likely to follow.

To illustrate the two varieties just described, will report the following cases:

Case 1.—Mrs. Y., aged 34 years, married, good family history, enjoyed fair health, and menstruated regularly without pain until 19 years old, when, during her menstrual period, she drank freely of iced water when she was very warm while working in the harvest field. From this she took a severe chill, and had suppression of her menses, attended with pain, chills and fever. A catarrhal discharge from her uterus very soon set in. She suffered intensely from dysmenorrhœa at each period, not being entirely free from pain at any time.

She was married a few months after drinking the iced water, but lived a sterile life. Her suffering continued—sometimes worse, then again better. The pain was mostly confined to her left side, and was of a burning, throbbing nature. She would have frequent attacks of what she called "inflammation," which were doubtless local attacks of peritonitis from salpingitis. Suffered at times from cephalalgia, which was doubtless reflex from her uterine organs. Many different physicians prescribed for and treated her with no permanent benefit. The only relief she experienced from pain was while under the influence of morphia. August 20, 1890, fifteen years from first attack, I was called to visit her at Sparta, Ohio, in consultation with the attending physician, Dr. J. F. Fox. We found her confined to bed, very nervous and weak. Upon examination, her uterus was found to be stationary in pelvis from adhesions, slightly retroflected, with marked stenosis of cervix. A well-defined tumor was located in her left side which strongly resembled a salpinx.

An operation for the removal of the diseased tube or tubes was recommended as the only means of relief, which was readily consented to. She was then put upon a course of tonic treatment and requested to exercise daily in the open air. Two months later, October 30, after a thorough preparation of patient, I opened her abdomen, assisted by Drs. J. F. Fox, E. O. Morrow, W. H. Bocher, T. H. Brannan, C. H. Goodrich and D. L. Gans, and found a large hydro-salpinx on left side, with a small hematoma of left ovary. The salpinx was adherent in the lateral side of the posterior cul-de-sac, and to the broad ligament, and was with considerable difficulty removed, on account of the adhesions. The ovary was also removed. The pedicle was tied with a silk ligature and dropped. The right ovary and tube seemed natural and were left. There being no hæmorrhage of any account from the torn adhesions, the abdomen was closed without a drainage tube, silk sutures being used.

She made a good recovery, now weighs 140 pounds, a gain of 21 pounds since before the operation, menstruates regularly and without pain.

Case 2.—Miss B., aged 20 years, unmarried, family history good. At the age of 16 years she aborted at 5 months, from which she claims to have fully recovered. Two years later she contracted gonorrhœa, from which she did not recover, but was left a physical and mental wreck from pyo salpingitis. The result doubtless of gonorrhœal infection. December 8, 1890, I was first called to visit her, when I found upon examination, a double salpinx. Both of them closely adherent to the uterus and adjacent parts. They felt firm and inelastic, and so closely united to the uterus, that they seemed to be a part of it. She suffered continued pain, worse during the menstrual period. There was a purulent looking discharge coming from her uterus.

December 12, 1890, I opened her abdomen, assisted by Drs. T. M. Johnson and J. S. Pyle, when we found my diagnosis to be correct. A double salpinx, the left one was adherent to the lower part of the pelvic floor, as well as to the uterus. And it was with great difficulty that the adhesions were broken up. The right one was higher up in the pelvis and adherent to the uterus and broad ligament. The adhesions were also with difficulty separated; they were both ligated with iron-dyed silk sutures, close to the uterus and pedicles, seared with a galvanic cautery and dropped. They were so matted together by adhesive inflammation that we could not distinguish the ovary from the tube. In fact they cannot now be separated, as you can see by the specimens. As there was but little hæmorrhage no pus escaped into the peritoneum, and the abdomen was closed without a drainage tube. Iron-dyed silk sutures were used.

Patient made a good recovery and is to-day well and hearty, weighs heavier than ever before, and is perfectly free from pain; menses regular, and unattended with pain, but they continue from seven to ten days. There is still some little discharge from her uterus.

Case 1.—The cause of the salpingitis was evidently catarrhal endometritis, which was the result of suppression of her menses from drinking the iced water. Had this catarrhal endometritis been treated early by the proper remedial means, salpingitis might have been prevented, and the poor woman saved many years of suffering and the loss of an ovary and tube.

Case 2.—The cause was a specific one; quite different from case 1, and should teach us a lesson that gonorrhœa in the female is a more serious disease than we formerly looked upon it to be. For the disease may extend from the vagina to the uterus, and from the uterus to the Fallopian tubes and the peritoneum.

45 West Tuscarawas St.

ADDRESSES.

AN ADDRESS DELIVERED AT THE OPENING OF THE SECTION OF SURGERY.

At the Annual Meeting of the British Medical Association, held in Bournemouth, July, 1891.

BY JOHN WARD COUSINS, M.B.LOND., F.R.C.S.,
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RECENT ADVANCES IN THE TREATMENT OF TUBERCULOUS DISEASES OF THE JOINTS.

Historical Notes.—During the past thirty years very remarkable development has taken place in all departments of our art, and although I think the expansion of our knowledge in connection with diseases of the joints has been less brilliant than in many other directions still it has not been less radical as regards the system of treatment. Until the time of the late Sir Benjamin Brodie confusion and uncertainty surrounded the classification of disorders, but by the labors of this distinguished surgeon many of these diseases were disentangled from each other, and the affections of the articulating apparatus, which had been grouped together under the common designation of "white swelling," were clinically separated. In the fourth edition of his work on *Diseases of the Joints*, published in the year 1836, he graphically described tuberculous disease of the bones as commencing by the deposition of a transparent material in the cancelli, and afterwards undergoing transformation into a yellow cheesy substance. He drew a correct picture of the slow progress of the inflammation, the caries of the bone, the recurrent centres of suppuration, and the final termination either in imperfect ankylosis or complete disorganization of the joint, associated too often with pulmonary disease or some other visceral affection.

Brodie and Liston investigated the morbid alterations in articular cartilage and synovial membrane. They regarded the cartilages as prone to primary alterations of structure, and they initiated the doctrine that suppuration was a rare result of their primary ulceration, and that it took place only in the advanced stages of the disease, with caries of bone and destructive changes in the synovial membrane. They regarded the presence of capillaries as an essential condition of the inflammatory process, and they labored to demonstrate the vascularity of cartilage in disease. The pathological doubts and difficulties of these eminent surgeons occupied the attention of many of their followers, and their clinical observations were marked by clearness and accuracy, but their minds were prevented from forming correct interpretations of their facts by their strange prejudices and imperfect views of the healthy and morbid processes.

Some of the problems surrounding this structure were, however, at length solved by the labors of Redfern, Goodsir, and Rainey. These observers clearly demonstrated the changes which took place in cartilage by the perverted activity of disease. They asserted that it remained entirely non-vascular, and that its disorganization was always accompanied by changes in the size and form of the corpuscles, and the softening and breaking up of the intercellular substance. During the process of repair they discovered that fibrous tissue has formed, and that into this new substance vessels were projected from the vascular system of the bone and synovial membrane, and thus the difficulties concerning the vascularity of inflamed cartilage were cleared away.

The Old Pathology of Tubercle.—The loss of substance in articular cartilage long occupied a prominent place in the pathology of joint disease, and observations on the wear and tear of this texture in the joints of men and animals were utilized in support of a mechanical theory of incipient disease. At length, however, these narrow

doctrines languished under the expanding power of broader views. The belief soon became general that joint disease could have an origin in any of the joint structures, and that most frequently the error commenced in the bone or the synovial membrane. In a large proportion of chronic affections the morbid changes were found to be the results of a peculiar inflammation, attended by the deposition of a semi-transparent exudation, which had a tendency to unhealthy suppuration, and to undergo fatty transformation. Pathologists diligently studied the scrofulous affections of bone, and for a long period of years the essential element in the process was described as a deposit of tubercle—a formation of low type which sooner or later excited destructive changes in the surrounding structures. In one case synovitis issued in a gelatinous degeneration which ultimately extended to the bone and cartilage; in another case, the deposition of tubercle in the cancellous structure caused an expansion of the bone which incessantly progressed towards softening and caseous changes, inflammation of the fibrous capsule of the joint, and hopeless destruction by suppuration and caries.

The Scrofulous Diathesis and Tubercle.—Now, the universally accepted theory of all these changes was the unfortunate possession of a bodily or constitutional condition which was styled the strumous cachexia. This was explained as an altered direction of the normal nutrition of the system, which could make itself visible by a slight provocation in any of the structures or organs of the body. Scrofula was regarded as an inherited or acquired constitutional condition, which might at any moment assume the appearance of a distinct tuberculous disease. On the other hand, tuberculosis was always manifested by a wider departure from normal nutrition, and presented new and lowly-organized formations which were deposited somewhere in the organism in the course of chronic strumous inflammation. Virchow described scrofula as a disease of the lymphatic system, and tubercle as a new product derived from the lymphatic elements of connective tissue.

Universally, then, tuberculosis was defined as an inheritance very variable in individuals; at the same time, outside influences were recognized as powerful factors in kindling the smouldering flame into activity. For many years the nature of tubercle received profound investigation, and on every hand the results of research tended to establish the time-honored theory. The microscope failed to detect in it a specific element. All the histological constituents were in turn considered the essential ingredient in the deposit. Cells and granules, epithelial elements, and cells of giant form, were searched for some characteristic quality. Some of them appeared embedded in a fine homogeneous stroma, while others were either shrivelled or drowned in particles of oil, or were buried in molecular matter. The morbid changes in bone were searched over and over again, but in the process of degeneration and caseation only negative elements were discovered. In one part the osseous structure was observed undergoing destruction, in another the osteoblasts were at work forming masses of protecting bone. With one voice the microscopists declare that they could find no specific element, and that tubercle was so definite in structure that it could be recognized by negative rather than by positive characters.

Now these were the opinions which for more than half a century were confidently taught in all the schools. Surely the experience of our day is sufficient to convince that there is no part of our pathology which may not be transformed, and no theory which may not be pulverized by progress. These doctrines were considered orthodox for many years, and by the profound investigations of many eminent men all difficulty appeared to have been passed away. Tubercle had been examined by the best observers in the civilized world; thousands of clever eyes had gazed at it with intense persistency and curiosity, and with a remarkable unanimity they pronounced

the opinion that it really contained nothing but cells.

The Modern Pathology.—In the year 1882 the whole pathology of tuberculosis underwent a great evolution by the complete demonstration of the life-history of the tubercle bacillus. The disease occurring in any tissue of an organism must now be regarded as a specific disorder, the bacilli as the direct cause of all the morbid changes, and their presence as the distinctive sign of the disease.

Now it is only by drawing a comparison between the old and the new pathology that we can really decipher the magnitude of the revolution in our conceptions. We no longer fight about the primary seat of the disease, for it is now certain that it may commence in any of the tissues of a joint. At the onset it may be synovial or osseous, and when the origin is in the latter structure it may select its surface or its substance. Strumous disease of the bones and joints is the same disease as tuberculous disease of the bones and joints; for in all these affections a specific deposit can be detected. Tubercle bacilli are never found but in this special product, and wherever the tuberculous tissue is discovered this microbe has obtained a resting-place. Their number may vary in the diseases of different structures, and also at different periods of the same disorder; still, when only a few are present they will be found by careful scrutiny.

The new pathology of tubercle is sustained by a mass of evidence derived from microscopic research, the artificial cultivation of the parasite, and experimental inoculation, so that the old notions which had long surrounded the disease have been numbered with the things of the past. The long-accepted causes, too, have been dislodged from their position, and are rightly grouped as morbid tendencies. The inheritance of constitutional peculiarities, the liability to chronic inflammations, and the susceptibility to external influences are thus regarded as essential conditions which help the microbe to establish itself within the body. Still, these factors are not less potent because the specific character of tuberculosis has been recognized. Hereditary proclivities and physical peculiarities of structure have not fallen into insignificance, but in their new position it will be possible to better estimate their potency.

Hereditary Transmission.—As regards the old doctrine of hereditary transmission, must we abandon it altogether? How is it possible for the disease to be conveyed from the parent to the embryo, unless the spores of the bacilli are themselves actually transmitted? The living particles have in themselves no penetrating power, still their vitality is certainly intensified by contact with living tissues. As a general rule, they make an entrance into the body by the mucous surfaces, and then their diffusion is secure through the ever flowing streams of blood and lymph. We know that they find their way into the bones and joints, and there appears nothing likely to prevent them getting entangled with equal ease in the placental structures. I believe, however, that there is at least some evidence in support of the assertion that the microbe can pass freely from the mother to the foetus.¹ The great discovery of Koch may have around it many problems yet to be unraveled. It is, however, a fact of history that, by his profound research, he brought to light from the microscopic elements of tubercle a living atom which no human eye had seen before. Some have been so generous as to call it a lucky hit, but let us remember that the accident happened to a man of untiring energy and prodigious power of mental concentration, and these are qualities as essential for success in science as the full activity of the higher intellectual forces. I regard this power of mental concentration as the noblest element of genius. Do not the histories of men illustrious in science exhibit a passion amid their solitary labors? Every line of eternal truth that has been added to our knowledge, every new fact that has been brought to light from the deep secrets of the universe, every noble success in the

¹ Birch-Hirschfeld and Schmöll, Beiträge zur. path. Anat. und zur allg. Path., 1891, p. 429.

onward march of science, every triumph achieved over the mysteries of the natural world, are the offspring of unceasing devotion.

Arrest Possible in the Early Stage.—The modern pathology of tuberculosis has already exercised a salutary influence over surgical treatment and the progress of conservative surgery. Its distinct recognition of a specific and infectious disorder, in all its various manifestations, has placed the hope of arrest on a very different basis to that which it previously occupied under the old constitutional theory. During the early stages of joint disease the morbid action is often localized, and, therefore, arrest is at least possible. There can be no reason why a joint or a bone should not recover, and the tuberculous infiltration atrophy, and ultimately shrivel into a fibrous scar, just like a similar deposit in the apex of a lung. If the number of bacilli found by microscopic observation in a part are to be taken as any indication of the activity of the disease, then repeated observations are favorable to the conclusion that incipient disease in the articulating apparatus is more hopefully situated than incipient disease in the pulmonary tissue.

It is true that the early arrest of tuberculosis has long been the result aimed at by treatment. Half a century ago Brodie described the slowness of the process. The cure in the advanced stages, he said, began when the sinuses closed and the oedema of the limb subsided, but the morbid changes in the joint generally terminated in more or less ankylosis, caused by the destruction of the articulating surfaces. The diseased limb should be kept in a state of perfect quietude; not that this alone would restore the bones to a healthy condition, but it would do much to prevent the inflammation extending to other structures. He recommended constitutional treatment, residence at the seaside, nutritious diet, and exposure to fresh air.

We now restrict the term tuberculosis to those local and general changes which are directly caused by the irritation of a specific bacillus. Under favorable conditions, isolated patches of tuberculous formation may undergo atrophy, and the infiltration around them cease to extend. This arrest is the result of the timely death of the micro-parasite, for surely by its destruction alone the morbid action in the diseased tissues can be localized, and the individual delivered from the danger of a diffused tuberculosis. What, then, constitutes the grave difference between this curative process and the insidious progress of the disorder? Does it depend upon the strength of the inoculation and the number and vitality of the bacilli; or is it due to the intensity and persistency of the predisposing conditions or other factors in the causation which may be vital, or chemical, or structural peculiarities of blood and tissue? In the light of new facts, I think we must admit that the case is really dependent upon the complete destruction of the specific cause within the affected structures. At the same time, experience teaches us that arrest is possible, and that this fortunate issue may be obtained by the healthful influence of sunlight, pure air and good food upon the whole organism. I wish some philanthropic millionaire, for the sake of humanity and science, would try the experiment of submitting five hundred scrofulous children living in the slums of our large cities, and suffering from incipient joint disease, to the renovating power of good food, in combination with seaside purity and brightness, for at least eighteen months, and I am sure some of them would by these potent remedies, and the application of a simple splint, escape from more serious surgical treatment.

Value of Expectant Measures.—In the management of joint disease we must take care to select the right moment for surgical interference. It is often an anxious question to decide when expectant measures ought to be abandoned. In the early stages the diagnosis may be open to question. Sometimes the threatening symptoms may be traced to a traumatic cause. There may be nothing

in the local condition to indicate its specific character, and the general conformation and nutrition may point to any predisposition to tuberculous inflammation. The affected joint may be swollen and occasionally painful and tender. Its outline may be altered and the normal movements impaired, and these slight indications may be marked by a persistent tendency to recurrence. In some cases the morbid action appears to have subsided, and the joint structures to have regained their healthy condition, but this favorable quiescence may be disturbed by the slightest injury, and any trivial accident may rouse again the dormant malady. Occasionally we obtain evidence of arrest many years after the favorable issue has occurred. I have seen several cases in which slight shortening of a limb has not been recognized until puberty, the period of life when the skeleton is in a condition of active development. The osseous deficiency is the result of latent mischief near the growing line, or the remnant of bygone epiphyseal inflammation which happened during early life.

The Late Hugh Owen Thomas.—A few years ago strenuous children laboring under chronic joint disease were kept in bed for many months, but now expectant treatment can be carried out more hopefully by combining rest and protection of the limb with fresh air and exercise. The management of incipient joint disease has fortunately undergone a silent revolution through the mechanical genius of the late Hugh Owen Thomas, of Liverpool. His surgical appliances are admirably adapted for taking off concussion, arresting friction, and imparting support and protection without pressure; at the same time they are so simple in construction that the patient can adjust them without assistance. Thomas splints have been utilized by surgeons in all parts of the world, and the name of our old colleague will long have an honorable place in the surgical records of our time.

Tuberculin.—When, a few months since, the celebrated announcement reached us that a new remedy had been discovered which possessed the remarkable power of causing the necrosis of living tuberculous tissue, a new method of arrest appeared probable in recent cases, and material improvement in others of greater severity which would prepare them for surgical treatment. It is not my intention, however, to invade the arena of my distinguished colleague, Mr. Watson Cheyne, who has promised today to tell us the results of his elaborate investigations with tuberculin, but I feel bound to mention the remedy although I have used the remedy in many cases of joint and bone disease without decided benefit, it will still receive from me a full and impartial trial. It is certain that it contains an agent which is capable, even in almost an infinitesimal dose, of exciting active changes in the body containing any traces of active tuberculosis. In the chemical aspects of microbial life, and in the complex bodies which are formed by the artificial cultivation of the bacilli themselves, we discern the direction from which we may anticipate future discoveries. I regard the search for a remedy amid the growth of these living particles as a splendid effort to reduce the magnitude of world-wide pestilence, for which, up to the present moment, no really scientific treatment has ever been propounded. The great German investigator has not yet finished his work; let us patiently wait for his results and keep ourselves free from prejudice, hoping that his daring assault upon the most deadly of diseases may ultimately be crowned with success.

Surgical Treatment of the Past.—The recognition of the local character of tuberculosis in diseases of the joint has opened up the high road to many of the recent advances in surgical treatment. Sixty years ago these disorders were described by Sir Benjamin Brodie as having their origin in the cancellous structure of the bones or as a consequence of inflammation extending from the synovial membrane to the osseous tissue. Morbid action, he said, commenced sometimes in one and sometimes in another texture, and in the advanced stages, all the

tures of the joint became involved in the disease. At that time, however, the surgical treatment was really else than splints and plasters, incisions and punctures, and at length amputation as a final remedy. The constitutional theory of tuberculosis blocked the road of progress.

Fergusson and Butcher.—Between the years 1830 and 1850, Syme in Scotland and Liston in London revived with energy the resection of joints for disease, an operation which had been occasionally performed by British surgeons half a century before. But it was not until Sir William Fergusson had successfully practiced it that resection became an established manipulation on all the joints, and professional prejudices were vanquished. Within a few months since, Richard Butcher, of Dublin, died away after a long and brilliant career. He is remembered, too, in his day, to resuscitate the practice of resection, and devised the well-known saw especially for joint operations, and this ingenious instrument has certainly assisted the progress of conservative surgery.

Early Efforts.—Until the last few years early operations in joint disease had scarcely received any attention. In 1878, Volkmann, the inventor of the cutting spoon, performed several partial excisions in recent cases of joint disease, but his results did not stimulate him to further trials. Since the year of the pathological revolution (1882) many favorable cases have been recorded, and I feel confident the practice, although still regarded by some as experimental, has already saved many limbs from graver operations.

Advantages of Early Operation.—Whenever the indications for surgical interference are clear, early operation must be attended with many advantages. The risk of delay is always in proportion to the progressive and obstinate character of the disease, and timely aid will often prevent its extension, and at the same time deliver the patient from the danger of deep infection and the development of secondary tuberculous centers. The only hope of cure must depend upon the complete removal of the diseased tissue, and the facility with which this can be accomplished rests entirely upon the extent of the local mischief. The preservation, too, of useful mobility in the joint may be anticipated when the morbid process is well localized, so that the manipulation involves only a limited excision of synovial membrane and a partial division of the fibrous capsule.

Partial Arthrectomy.—For the successful performance of a partial arthrectomy there must be clear evidence of a localized deposit. In some cases children have exhibited very little pain or lameness, but the joint has been some part swollen, with the capsule thickened and the vessels enlarged, but without any indication of softening or suppuration. By a well-directed operation near the neck of the femur or the head of the tibia, search has been made for a spot of tuberculous infiltration, with the result that a carious cavity has been found and small sequestra successfully removed. Surely these are examples of the enormous gain obtained by early operation.—If the latent disease had not been detected and cut out, the issue must have been irreparable injury of the articulation in every instance, and a more serious manipulation under conditions far less favorable.

Another recommendation for early arthrectomy is the little danger that attends the operation. With ordinary surgical precaution the risk may be fairly considered trifling, even when a portion of bone has to be resected. After a full incision in the most convenient position for exploration, and carefully defining the disease, the infiltrated tissue must be excised with the scissors or cutting spoon, and the cavity thoroughly flushed with hot water. To insure rapid union, the surface should be then dried, and the wound closed with deep and superficial sutures. The limb must be kept at rest until the healing process is complete. Up to the present time a great many par-

tial arthrectomies have been performed in this country by different surgeons, but I am not prepared to state the exact proportion of their permanent successes; and it appears to me that a report of the results of early operations from many hospitals would prove at the present time a very valuable record.

Advancing Local Tuberculosis.—The articular cartilages are seldom the seat of primary disease, for as a general rule, the morbid process has its origin either in the synovial structure or the articular extremity of the bone. When the osseous tissue is the seat of a tuberculous infiltration, the evidence of its existence is often wanting until softening occurs within it, and inflammatory reaction takes place around it. As soon as these infective changes reach the synovial membrane, they extend to all the structures of the joint. Sometimes they make their way through the superficial cancelli to the outer layer of the bone, and then superficial caries and slow suppuration are the result. At another time the morbid process advances in the direction of the articular cartilage, softening and erosion of the structure follow, and then inflammatory changes which issue, unless checked by surgical treatment, in chronic abscess, caries of bone, imperfect arrest of the disease, and finally ankylosis. Now in all these forms of advancing tuberculous disease, surgery offers the only scientific method of treatment, and we can safely repeat our incisions, scoopings, scrapings and cleanings, until the disease is eradicated and a useful joint preserved.

Sudden Infection of the Joint.—But instead of a slow disorganization, the tuberculous centre may be suddenly discharged into the capsule, diffusing the infective material over the whole synovial surface, and kindling suppurative inflammation with great rapidity. A few months since I performed arthrectomy on a child for acute infection of the knee-joint. In 1889 the little patient was under my care, in the Royal Portsmouth Hospital, laboring under a small subperiosteal abscess over the head of the tibia, close to the reflection of the synovial membrane. The swelling was freely incised, and a considerable deposit of caseous material cleaned out with the spoon. The bone was roughened perilously near the articular edge, and the parents were especially warned of the danger. Soon after the child left the hospital, the swelling slowly recurred without either pain or lameness. In the month of July last she hurt her knee during a game of play. Acute pain immediately followed the accident, attended with rapid swelling of the joint and fever. Three days after she was readmitted to the hospital under my care. The knee was at once freely opened on both sides, and the inner incision was carried through the abscess cavity over the head of the tibia. The capsule contained about 3 ozs. of a turbulent fluid with many flakes. The infiltrated synovial membrane was freely incised with scissors, the joint thoroughly cleansed, and the limb carefully placed on a back splint. Irrigation was continued for a week. The child was discharged quite well in January. The movements of the knee are now normal, a result due to immediate treatment and the limited injury of the synovial membrane.

Complete Arthrectomy.—Permit me now to offer a few remarks on the surgical treatment of more advanced cases, in which the morbid process is too extensive for any partial operation. In the performance of complete arthrectomy, a free division of the ligaments and capsule is necessary for the exploration of all the recesses of the articulation, and the excision of deep infiltrations of the synovial and osseous structures, so that the preservation of only a limited mobility must be anticipated. The whole of the pulpy granulation tissue must be dissected off, and the ligaments and cartilages carefully scraped. It is absolutely necessary to remove every particle of the diseased synovial membrane, and all tuberculous foci in the bones must also be cleanly cut out with the gouge. Care must be taken to prevent any remnants of the infective tissue being left behind on the raw surfaces, and

² Successful cases reported in the British Medical Journal by Messrs. Watson Cheyne, A. Barker and Charters Symonds.

the accidental reinoculation of the disease through the medium of the fresh incisions. I regard the method advocated by Mr. Arthur Barker, of flushing with hot water the seat of operation, to be the best way of carrying out these important precautions, and for the rapid performance of this part of the operation, his ingenious scoop and irrigator will be found of great practical utility. The operation of arthrectomy of the hip can be readily performed by the anterior and vertical incision and division of the neck of the femur with the saw, and then the excision of the infiltrated tissues. After a simple protective treatment for a few weeks, and the application of a Thomas' splint during convalescence, the results are often very satisfactory.

Surgical Treatment in the Advanced Stage of Hip Disease.—With reference to the old method of operating in the advanced stages of the disease, after suppuration has been proceeding for months, and sinuses have long riddled the soft parts, and when the unfortunate patient has been exhausted by a general tuberculosis, I sincerely hope it will soon be cast into the shade forever by the light of modern progress. It is my experience that these distressing cases recover more frequently by simple measures, consisting of free incision, scooping, irrigation and drainage, and that the ultimate results are more satisfactory than those which follow the practice of severe and dangerous operations.

Complete Arthrectomy of the Knee-joint.—In performing complete arthrectomy of the knee joint I consider the old horse shoe incision, and an oblique division of the ligament patellæ, better than any other method for obtaining free access to the interior of the cavity. The practice of lifting up the tuberosity of the tibia instead of division of the tendon may be found very useful in some cases. It is important to clean carefully the lateral and crucial ligaments, and to avoid damaging the cartilages and articulating surfaces. Sometimes carious bone can be removed with the gouge outside the capsule of the joint. It must always be our object to secure the complete extirpation of the diseased structures, and to preserve as far as possible the mobility of the articulation. Fortunately the limb is not shortened, and the development of the bones is scarcely impaired. The articulating surfaces are in a great measure preserved, and the operation when compared with resection of the joint is attended with less risk of life. After arthrectomy I have seen a sound and useful limb with movement to the extent of 45°, and the patient capable of standing and walking many hours every day without fatigue. So good a result can only be anticipated under favorable conditions and early surgical interference. I have received from my colleagues in different places very varying reports of their successes. Sometimes they claim firm ankylosis, but at other times their operations have issued in weak limbs and joints, tending to serious flexion and displacement. Many of them were, no doubt, too late arthrectomies, and the careful excision of the bony surfaces would have been followed by firmer and better results.

The Old Operation of Excision.—With reference to my own practice, I prefer at once complete resection in all cases marked with old sinuses and the carious remnants of old infiltrations. My method is to freely open the joint and to remove as thin a layer of bone as possible from all the articulating surfaces. The gouge is used for cleaning out any infiltrations, and then the patella is divided vertically with the saw. After cleaning every recess in the capsule, the bones are jammed together as tightly as possible, the periosteum is carefully sutured, and the wound closed, except at the extreme ends of the incision. Now, I do not presume for a moment that my results are exceptionally good, but I beg to submit to you photos of some of my patients upon whom operations were performed many years ago. I have often questioned them with reference to the inconvenience of the ankylosis, and, without exception, they have regard-

ed it with indifference. One patient volunteered the remark that the only annoyance her stiff limb caused her arose from the necessity, when sitting in company, of crossing her legs.

Conservative Surgery in the Advanced Stages of Tuberculous Disease.—I am no advocate for any attempt at conservative surgery in the advanced stages of the disease, not from the dread of deepening the general and local infection from re-inoculation through the seat of operation, but rather from the feebleness of the vital power which has been slowly undermined by prolonged suffering and suppuration. The intensity of the disease has been quickened by a chronic septic condition of the system, and it is the danger of its sudden aggravation, even with every possible precaution, which adds to the risk of surgical interference. The microorganisms of septicæmia, or their poisonous products exert a marked influence over the course of tuberculosis, for their presence reduces the resisting power of the system, and helps on the local and constitutional spread of the disease.

But it is not only septic infection in its various forms that we have to combat, but every other kind of acute disorder of the blood. Children especially are liable to be attacked with any of the infectious fevers; and these are all attended with peculiar risks. Measles, from its disturbing influence over nutrition, is prominent among the group, for its power of rekindling tuberculous inflammation.

Occasionally, however, I think that my experience has seemed to point in the opposite direction, and that an accidental blood storm has exercised a remarkable effect on the course of the malady. A young woman, who for many years had suffered from old disease of the knee, came under my care in consequence of acute inflammation of the joint, which she attributed to injury. Prior to this event she had undergone a good deal of surgical interference. Some years since I did a plastic operation for her, and in 1887 I performed abdominal section for pelvic suppuration and chronic peritonitis. A few days after her admission to the hospital her distress was so great and the constitutional disorder so acute, that I decided to amputate the leg. She was, however, I think very fortunately attacked with severe erysipelas of the head and face, and after a few weeks' dangerous illness her recovery all round was so remarkable, and the joint symptoms so much reduced, that I did an excision. The wound healed with rapidity, and she is now earning her livelihood on two legs instead of one.

Now, notwithstanding the opinion I have expressed concerning the risk of late operations, exceptions occasionally occur in practice when interference appears to be the better course. There are certainly cases of chronic tuberculous joint disease marked by secondary centres and general infection, and even aggravated by a chronic septic condition of the system, in which the vitality of the tissues and the residue of constitutional vigor appear sufficient to warrant an effort in the direction of conservative surgery.

Permit me to offer you two examples. 1. Here is the photograph of a girl taken a few months after excision of the elbow. At the time of the operation she was laboring under partially arrested hip disease with still one discharging sinus, and tuberculous deposit in many parts of the glandular system. She is now able to follow any occupation. 2. This is the likeness of a young woman, an orphan, with strong tuberculous history, upon whom I did a similar operation on a joint riddled with sinuses and surrounded with infiltrations. She had distinct physical indications of pulmonary complication, old disease of the opposite knee, and a persistently elevated temperature. She has now recovered with a useful arm, and is enjoying apparently good health. I am quite aware that these may prove only temporary successes, but it is our duty to look always on the hopeful side. I am, however, quite certain that their future prospects have been improved by surgical interference.

THE

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BY-LAW IV.—THE PUBLICATION OF PAPERS AND
REPORTS.

No report or other paper shall be entitled to publication in the
volume for the year in which it shall be presented to the Associa-
tion, unless it be placed in the hands of the Board of Trustees on or
before the first day of July. It must also be so prepared as to re-
quire no material alteration or addition at the hands of its author.
Authors of papers are required to return their proofs within two
weeks after their reception; otherwise they will be passed over and
omitted from the volume.
Every paper received by this Association and ordered to be
published, and all plates or other means of illustration, shall be
considered the exclusive property of the Association, and shall be
published and sold for the exclusive benefit of the Association.
The Board of Trustees shall have full discretionary power to
omit from the published *Transactions*, in part or in whole, any pa-
per that may be referred to it by the Association, or either of the
Sections, unless specially instructed to the contrary by vote of the
Association.

LONDON OFFICE, 57 AND 59 LUDGATE HILL.

SATURDAY, AUGUST 15, 1891.

EMULSIONS.

Among the interesting and valuable papers
read before the Tenth International Medical Con-
gress at Berlin, was one by Dr. B. K. RACHFORD,
of Cincinnati, on the fat splitting properties of
the pancreatic juice. A more extended presen-
tation of the subject by the same author appear-
ed in a late number of the *Journal of Physiology*.
RACHFORD opens his paper with some remarks
on emulsions, which it is our purpose this week
to review briefly.

In 1878 GAD called attention to the fact that
when a drop of oil containing 5½ per cent. of
fatty acid was carefully placed on a one-fourth
per cent. solution of sodium carbonate, a perfect
emulsion was immediately and spontaneously
formed. A very little more or less than 5½ per
cent. of acid gave an incomplete emulsion. From
these facts GAD concluded that outside mechani-
cal force was not necessary to the formation of a
perfect emulsion, but that the chemical force
which was developed from the soap formation,
was itself sufficient to break the oil into the
smallest globules, and that the soap formed coated
the globules and maintained the emulsion.

RACHFORD found that no amount of stirring or

shaking would produce a permanent emulsion of
either neutral or rancid olive oil and distilled
water, nor with neutral oil, and one-fourth per
cent. carbonate of sodium solution, but that
shaking would produce a good permanent emul-
sion of rancid oil and one-fourth carbonate of
sodium solution, even though the oil contained a
very large or a very small percentage of free acid.
Yet the spontaneous emulsion only forms when a
definite percentage of free fatty acid is present.

When olive oil is heated it is partly split up
into fatty acid and glycerine, and in this condi-
tion is readily emulsible, but if it be neutralized,
it is no longer emulsible, showing that the acid
is necessary for its emulsification. As RACH-
FORD suggests this fact is no doubt of import-
ance in connection with the cooking of fats, the
partial splitting up of the fat by the cooking
preparing it for its subsequent emulsification.

RACHFORD also found that if bile be present
an emulsion cannot form, although all the
conditions otherwise favorable to its formation
be present. If bile be added to an emulsion the
moment after it is formed, the emulsion rapidly
clears by creaming, but no free oil appears on the
surface. Here it seems that the soap not in
membranes is dissolved; this increases the specific
gravity and diminishes the viscosity of the liquid,
and as a result the soap-coated globules rise to
the surface as cream. If bile be added to an
emulsion some minutes after it has formed, it has
no effect in destroying the emulsion. The
stronger acids, even in very dilute solution,
rapidly destroy the emulsions, the free oil rapidly
rising to the top of the liquid.

The observations as to the influence of bile on
the formation of emulsions are particularly in-
teresting, as they show how bile regurgitated
into the stomach, could very seriously embarrass
the digestion of fats.

The formation of the spontaneous emulsion
was used by RACHFORD in a very ingenious way
to determine the action of the pancreatic juice in
fat splitting, and the effect of other digestive
agents in modifying this action. This part of
his paper we shall review next week.

THE ALVARENGA PRIZE for 1891, of the Col-
lege of Physicians of Philadelphia, has been
awarded to Dr. L. Duncan Bulkley, of New York,
for his essay on Syphilis Insontium.

THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES.

The second annual session of this Association, recently held in Washington, adopted a permanent constitution and by-laws, and the interesting session was marked by harmony and enthusiasm. Colleges becoming members of the Association must demand of their students, before they receive the M.D. degree, that they have attended three full courses of medical lectures of not less than six months each, no two courses being in the same year. The entrance examination, as prepared by Drs. OSLER and MILLARD, were adopted without change. These require that colleges becoming members of the Association, shall demand of all matriculates an entrance examination equal to the following :

1. By writing legible and correctly a composition of not less than 200 words.
2. By the translation of easy Latin prose.
3. By passing an examination in higher arithmetic or the elements of algebra.
4. By passing an examination in elementary physics.

It is provided, however, that the matriculates or graduates of recognized colleges of literature, science or the arts, or graduates of high schools of the first grade, or of normal schools directly supported by the State, be exempt from this examination. Students are allowed one year to remove a condition in Latin.

As provided at the Nashville meeting in 1890, the provisions of this examination become operative in 1892. In view of the high character of these requirements, one college withdrew from the Association, and a very few delegates that had the credentials of their college were deterred "for the present" from participating in the meeting. The colleges that at present withhold their support from the Association are of two classes: Less than half a dozen of our best institutions having a policy of extreme conservatism, or perhaps provincialism; secondly, about a dozen two-course institutions. Perhaps the colleges in the first class would not be benefitted by membership in an Association recently organized for the purpose of elevating the standard of medical education in the United States, but certainly they should give their moral support to the movement for bringing about a better system of medical education in this country. The policy

of the Association is to establish and maintain a minimum of requirements, below which no college can go and claim recognition or respectability. The Association has the enthusiastic support of the American Academy of Medicine and of the American Medical Association.

The Association should have the hearty support of all the high-grade schools. A majority of the colleges in the country are now members of the Association, and it is hoped that at the next annual session the membership will be so increased as to include every college in the United States whose teachers really desire a better system and higher grade of medical education in this country.

A MEDICO-LITERARY CURIOSITY FROM CHINA.

A somewhat unusual occurrence has been announced in the translation into Chinese of a semi-official English book, by an American medical missionary, which translation has a preface written for it by the prime minister, Prince Li Hung Chang. The book is a quarto reproduction of Squire's edition of the British Pharmacopœia. The prefatory remarks by the powerful Prince are volunteered for the purpose of inducing the physicians and druggists of that country to become better informed as to the latest developments of Western methods of treatment. And the editorial writer of the *Lancet*, July 4, comments upon the singular event by saying that for nearly all that it knows of Western healing, China is indebted to the underpaid and underestimated efforts of medical missionaries. This intelligent Prince, having experienced in his own family the benefits of a missionary physician's practice, in the saving of the life of his own wife after the native doctors had given over her case as incurable, became the instrumentality for the establishment, at Tient-sin, of a hospital of sixty beds, he agreeing to pay the current expenses for a certain number of years. This institution, known as the "Viceroy's Hospital," was built at a cost of \$10,000, contributed chiefly by the Chinese themselves. The same issue of the *Lancet* has an item with regard to the amount of surgical work sometimes performed at these missionary hospitals, stating that the brothers Doctors Neve, of Srinagar, Kashmir, did, in the year 1890, about 3,000 operations, of which 759 were capital or severe.

LIFE-SHORTENING OCCUPATIONS.

One of the curious features of modern life is the extent to which the most hazardous trades are overrun by applicants for work. The electric light companies never find any difficulty in obtaining all the linemen they need, notwithstanding the fact that the dangers of that kind of business have been demonstrated times without number. The men who work in factories where wall-paper is made frequently joke one another over the tradition that a man's life, in this trade, is shortened ten years. A similar belief is prevalent in factories where leather papers are made, and among men who have to handle them, and whose lungs are said to become impeded by inhaling the dust arising from those papers. In certain other factories where brass ornaments and fittings are made, the air is laden with very fine brazen particles which are, when inhaled, especially irritating to the lungs. But one of the most singular advertised calls for employes that ever was printed, appeared recently in a Connecticut newspaper, signed by a firm engaged in the business of building towers. It called for applicants only among those who are young, strong and courageous, and closed by saying, "We warn all seekers for this job that it is of the most dangerous nature, and that few men continue in it more than a few years. In fact, it is almost certain death to the workman who follows this occupation." This frankness on the part of the advertiser was commendable, and probably deterred no one who seriously canvassed the taking up of that occupation. There was presumably no dearth of candidates for this life-shortening, since the advertisement was withdrawn after a few days' publication.

IOWA STATE BOARD OF HEALTH.

The Secretary of this Board has made an official deliverance to the effect that habitual inebriety on the part of a medical practitioner shall be regarded as "palpable evidence of incapacity," and should render the drunken delinquent liable to the revocation of his certificate entitling him to practice in the State of Iowa.

AMMONIUM BROMHYDRATE vapors are recommended in lieu of ammonium chloride as an inhalant in some forms of bronchitis and nasopharyngeal catarrh.

DOMESTIC CORRESPONDENCE.

Antipyrin in Whooping-Cough.

Editor Jour. Amer. Med. Ass'n:—Though antipyrin has been recommended now for some time in the treatment of pertussis, I am surprised to find still a considerable amount of indifference in regard to its employment, either through ignorance of its beneficial effects or fear of its dangers. Like Sonnenberger, I am almost inclined to regard antipyrin as a specific in this affection, though in using the term *specific*, I am aware that the action of the drug is exercised not so much upon the disease itself as upon the nervous system, in quieting the reflex spasmodic cough. It seems to me that the conclusions drawn by Ssementschenko, after a close and careful experimentation, oblige us to consider the real cause of pertussis a bacillus, probably the bacillus of Afanassjew. This bacillus is specific. It is found in the sputum about the fourth day, or even earlier. It multiplies in the tissues of the body, and increases with the increase in the severity of the disease. With complications like catarrhal pneumonia it is discovered in the sputum in large numbers, and it is a long-recognized fact that this form of pneumonia differs from all the ordinary forms.

Rational medicine would, therefore, seem to indicate the use of antiseptic sprays and inhalations. Carbolic acid has long been thus employed, and I am still a strong advocate of it. But notwithstanding the use of the spray and the usual internal medication, the reflex irritability of the nervous system becomes so increased that the so-called spasmodic stage of the disease is the most distressing to the patient and his attendants. It is also the most dangerous, on account of the asphyxia by which the spasms are accompanied, and the troublesome pulmonary complications which are so prone to occur. It is in this stage, then, that sedatives are demanded above all other forms of medicine, and I know of none to equal antipyrin in allaying the reflex excitability of the nervous system. Of course I continue the carbolic spray through this as well as the earlier and later stages of the disease; but my attention is almost wholly given, at this time, to the relief of the spasmodic coughs which so quickly exhaust the patient's strength, destroy his desire for food, and prevent the necessary sleep at night. Sonnenberger declares that the best results are obtained the sooner the antipyrin is given in the disease; my experience leads me to believe that this early administration of the drug is not necessary in all cases. It is a powerful remedy, and must be employed in full doses to secure the desired effect, therefore I usually reserve it for the paroxysmal stage, and commence giving it only when the child begins to whoop.

During a recent epidemic of this disease in one of our suburban towns, I gave the antipyrin in three cases, aged respectively five, eight and ten years. All of the children, particularly the youngest, possessed a decidedly neurotic type of constitution. The disease was marked, characteristically severe, and passed regularly through the three typical stages. I began with the carbolic spray from the very outset of the trouble, combining with it

the internal administration of some of the older remedies of the sedative and expectorant class. In the second stage the paroxysms became so violent at night, particularly in the case of the youngest child, as to cause both myself and the attendants considerable anxiety. Frequently the spasms would be so severe as to completely arrest respiration for many seconds, and the ensuing cyanosis would be as pronounced as one ever sees it in this disease. With a feeling of complete exhaustion, the little patient would then throw herself on the bed, the eyes watering and the face highly flushed. Finally she would sink into a profound sleep, to be abruptly awakened soon again by a repetition of the same violent paroxysm. This was the state of affairs when I ordered for each of the children two grains of antipyrin three times a day, with an extra dose at bedtime. I furthermore directed the attendant to give the powder more frequently if this did not cause any decided amelioration in the frequency and severity of the paroxysms. To my gratification there was a change almost immediately. The coughing spells diminished to only two or three in the twenty-four hours; the child secured the needed rest at night, and the appetite and general health began to revive. Rarely was it necessary to give the powder oftener than as directed at first. During its administration I have never witnessed the slightest untoward symptoms. Sonnenberger gives it three times a day, in doses of about as many centigrammes (one-sixth of a grain) as the child is months old, or as many decigrammes (one and one-half grains) as it is years of age. While I do not think it would be safe to give the same dosage to all children according to such a fixed rule, I find that generally they bear larger amounts comparatively of the drug than adults. I would urge its careful administration at all times, beginning with the minimum dose, and increasing the same until the desired effect is obtained. Its beneficial action is undoubtedly due to the power which it possesses of depressing the reflex excitability of the nervous centers, and it should be administered, therefore, with a view to the effect rather than the mere size of the dose. I consider the carbolic acid spray, with the internal administration of antipyrin *pro re nata*, the most satisfactory method yet advanced for the treatment of whooping cough.

L. HARRISON METTLER.

4228 Greenwood ave., Chicago.

Premature Rupture of Membranes not Followed by Miscarriage.

To the Editor Jour. Am. Med. Assoc'n:—I remember reading in THE JOURNAL, some months ago of two cases in which premature rupture of the membranes was not followed by the usual result—a miscarriage. A case having come under my observation recently, I will record it, not for the purpose of going into a discussion of the subject, but as a mere statement of facts.

Mrs. R., multipara. White, 28 years of age; pregnant for fourth time; had, when about five and one-half months advanced, a severe fall—followed by an unmistakable flow of quite a quantity of the amniotic fluid. As no pain followed, the treatment was simply rest in

bed for twenty-four hours; after this she felt so well that she resumed her household duties. Pregnancy went to full term and a normal labor terminated in the birth of a strong healthy ten pound child.

Such cases are, I believe, sufficiently uncommon to be of interest to the general practitioner, showing as they do that labor is not the absolutely essential result of rupture of the membranes. Why one woman should have this result and another not is hard to determine. Probably the location of the opening into the amniotic sac is one of the important factors. Another, as I look at it, is the marked difference in the irritability of the uterus in different women. Certain it is some women miscarry on the slightest irritation to any portion of the uterus, while others will go to full term through falls, shakes, railroad accidents—even through the vigorous attempts at abortion performed either by themselves or by some of the human monsters that infest our cities and large towns.

The only treatment that such a case would call for would be rest—perfect rest in bed—and opium in some form to control the muscular action of the uterus.

Pains coming on in spite of this would indicate miscarriage, and then of course the treatment would vary according to the circumstances of the individual case.

JOHN W. JOHNSON, M.D.

Prof. Obst., Col. Phys. and Sur., Boston, Mass.

A Successful Method of Removing Foreign Bodies from the Alimentary Canal.

Editor Jour. Amer. Med. Assoc'n:—During the past few months, the writer has been consulted on several occasions by anxious parents whose children have swallowed bits of coin. In each case I have invariably given the parents similar advice. Place the patient upon an exclusive potato diet. The potatoes may be either mashed, baked or boiled.

This method in my hands has been thus far successful. This treatment is adopted, to the exclusion of all others, in the Vienna General Hospital, as I ascertained when visiting that hospital about a year ago. This manner of dealing with patients who have swallowed foreign bodies cannot be too generally known.

J. F. JENKINS, M.D.

Tecumseh, Mich., August 10, 1891.

BOOK REVIEWS.

LECTURES ON TUMORS, FROM A CLINICAL STAND-POINT. By JOHN B. HAMILTON, M.D., LL.D. 12mo, cloth, pp. 138. Detroit: George S. Davis. 1891.

This book, which is intended for the use of students, is the substance of twelve unpublished lectures on tumors, delivered at the Georgetown University in Washington. There are many books descriptive of the pathology of tumors, but few combine the clinical observations necessary to an

understanding of their treatment. This, the little book undertakes to do, and each in the long list of tumors mentioned in the accepted nomenclature, are spoken of briefly, and the symptomatology, diagnosis and treatment given. The book is said by our author to be really the introduction to a larger work on tumors of the regions which, in connection with other well-known writers, he has in preparation. In regard to nomenclature and classification, he adheres to that of the Royal College of Physicians and Surgeons, stating that while that is not at present the ideal classification, yet we must have some standard, and moreover, at the last revision the American Medical Association was consulted, and through the Army Medical Department's representative, the National Board of Health, then in existence, and Dr. F. Folsom, of the Harvard Medical College, were also advised with. The day has passed when every man should have his own nomenclature manufactured by himself, and the interest science demands uniformity in medical and surgical nomenclature, even at some sacrifice. The nomenclature recognized in the book was last revised in 1885 and the author truly says, there is considerable material now ready for the next committee of revision. The student will find here a complete elementary treatise on this obscure subject. As there is a field for the work, there is little doubt of its extensive sale.

PRACTICAL INTESTINAL SURGERY. BY FRED B. ROBINSON, B.S., M.D. 12mo. paper, pp. 166. Detroit: George S. Davis. 1891.

The best part of this book, is the dedication, for it is dedicated to Prof. Nicholas Senn.

The author is evidently a much better practitioner than a writer, for the book is painfully filled with ill chosen metaphor, faulty construction and worse logic, while the practical directions for abdominal work are fairly good.

We will make some quotations to justify this sweeping condemnation of the style of the author, indeed he may be said to have any.

Writing of the alimentary canal, our author thus discourses, on page 5:

"The strong muscular knots in the alimentary tract, though weak from the standpoint of disease, are subject to dilatation and contraction periodically. Their vascular supply is thus fluctuating, and subject to a maximum and minimum blood supply. At such points disease is apt to arise, just as it does in the changeable vital organs and breasts of women. Considerable muscular rings are found heaped together at the pylorus, cœcum and anus. In such periodically active tissue cancer delights to ensconce its wandering cells. The pylorus may be viewed as man's first physiological anus, the ileo-colic valve as his second, and the end of the rectum as his third but mechanical anus."

And again, on page 9: "I have found the cœcum in puppies at the end of the transverse colon; it had not yet descended, nor formed scarcely any descending colon." This is certainly an unusual situation in which to find a puppy, but we have no disposition to dispute our author's statement of facts.

On page 11, our author thus commiserates the uterus.

"Observe the poor vertical uterus around which woman is built, standing, doubtfully, capering on its giddy end, with its heavy responsibility balanced upward. Notice how it careers through a variety of naughty courses, of floods and drought, study the arrogant and defiant positions it assumes on account of man getting on his feet."

No other than the one who wrote the foregoing curiosity could have evolved the following sentence, which may be found on page 26:

"Without specifying names, I have observed death throughout abdominal literature for the past ten years in considerable numbers."

The reader will doubtless be greatly edified if he should try to analyze the sentence just quoted.

There is some good in the book, but it is generally couched in such bad form as to be of little value. We had rather praise than censure, but our duty as reviewer, and as well the true interest of American medical literature, require that such crude book-writing as is shown here, should be held up to view, that persons inclined to authorship, may refrain from encumbering our shelves with such trash, and unless our author rewrites his book, he will have another "death in abdominal literature" to "observe," quite near home.

A CLINICAL TEXT-BOOK OF MEDICAL DIAGNOSIS, for physicians and students, based on the most recent methods of examination, by OSWALD VIERORDT, M.D., Professor of Medicine at the University of Heidelberg. Authorized translation from the second improved and enlarged edition, with additions by Francis H. Stewart, A.M., M.D., of Brooklyn, with one hundred and seventy-eight illustrations. Philadelphia: W. B. Saunders.

This first English translation of so excellent a work finds itself a welcome arrival. The original found fewer readers in this country than it should have had, for reasons alike obvious and to be regretted. The translator has, however, brought its benefits within the reach of many who will appreciate his book, as well as the authors, and will deem as of secondary importance the rather numerous errata, which detract from the pleasure of the reader.

The division of the work into three parts—consisting of eight chapters and an appendix, is a convenient one.

Part I, embracing chapters one and two, is devoted to the general preliminary examination, systematically conducted and to be commended. This is supplemented by the translator in a note upon keeping records of cases, and a form for recording the results of a medical examination.

Part II, consisting of chapter three, is devoted to critical general examination of the individual patient. It is methodical and thorough, and like part one will be found to be specially serviceable to young physicians, though not without interest or usefulness to all.

Part III embraces chapters four, five, six, seven and eight. Under chapter four, examination of the respiratory apparatus is conducted in a very thorough manner.

Under chapter five, examination of the circulatory apparatus, is so subdivided and followed in detail as not only to be useful but to sustain interest in conducting the work of the examination.

Chapter six deals with the complication of digestion, examination of the digestive apparatus,—and is conducted in such manner as must result in convincing us of how much, and how little, we know definitely and reliably of the chemistry and physiology of digestion—salivary, gastric and intestinal—however well convinced we may be of the evils incident to its defective work, and the difficulty, as well as the importance, of remedying it. Chapter seven is devoted to examination of the nervous system. This is conducted in accordance with the scientific methods of the most advanced thought in the present state of neurology, and in following them, whilst advising what can be accomplished in elucidating many of the mysteries of the nervous system, one is forcibly impressed with what evidently yet remains unknown on this subject.

The appendix embraces some matters of general interest, especially what relates to bacteria, which come under consideration in the diagnosis of internal diseases.

The numerous illustrations throughout the work are generally above the average. Some of them are more than ordinarily successful delineations, and there are some good specimens of staining of bacteria. The index is full and satisfactory. The mechanical work throughout the book is good.

In all respects it is a desirable addition to a physician's library.

MANUAL OF CLINICAL DIAGNOSIS. By ALBERT ABRAMS, M.D. San Francisco: The Bancroft Company.

The author says in the preface of this small work that he makes no special claim to originality, that he has only "gathered a posie of other men's flowers, and nothing but the thread that binds them is mine own." While the writer thus

modestly sets forth his effort, we must remind him that a good text-book needs nothing original. We do not go to our school-books for critical discussions of mooted points, or for the detailed description of isolated experiments. A text-book should accurately represent the best and most approved opinion of the most advanced scholars in the particular branch of which it treats. It should be well arranged, with a good index, expressed in concise language, and free from controversial matter. An examination of the volume upon these lines shows that the writer has produced a compact and useful manual. If we would pass any criticism upon this book, it must be upon the score of what is generally a "good fault" in a text-book. The writer, in his efforts to be brief and concise, has to some extent sacrificed smoothness of diction; still, this is so much better than verbosity, that we freely forgive him.

MISCELLANY.

TRI-STATE MEDICAL ASSOCIATION.—The third annual meeting of the Tri State Medical Association will convene in Turner Hall, Chattanooga, Tenn., Tuesday, October 27, 1891, and continue in session three days. Indications are that it will be one of the largest medical meetings ever held in the South. Representative physicians from all sections will be present.

All who desire to read papers should send title to the Secretary of the Association before September 1. In due time a circular will be issued, giving a complete list of all papers and names of exhibitors who apply for space before October 1.

President—Robert Battey, M.D., Rome, Ga.; Secretary—Frank Trester Smith, M. D., Chattanooga, Tenn.; Secretary of Executive Committee—W. L. Gahagan, Chattanooga, Tenn., P. O. Box 542.

MISSOURI VALLEY MEDICAL SOCIETY.—The fourth annual meeting of the Medical Society of the Missouri Valley will be held at Council Bluffs, Ia., September 17 and 18. The Society has a membership of over 300. None but men of known professional standing are admitted as members. The membership extends along the Missouri Valley from Yankton, S. Dak., to St. Louis Mo. Physicians residing in South Dakota, Nebraska, Iowa, Kansas, and Missouri, constitute the membership.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from August 1, 1891 to August 7, 1891.

First Lieut. Alfred D. Bradley, Asst. Surgeon U. S. A., granted leave of absence for thirty days.
Asst. Surgeon William L. Kneedler, U. S. A., leave of absence granted is extended one month.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending August 8, 1891.

Surgeon R. A. Marmion, detached from Navy Yard, Norfolk, and to the Navy Yard, Boston.
Surgeon G. F. Winslow, detached from Marine Rendezvous, Boston and to the Navy Yard, Norfolk, Va.
Surgeon J. B. Parker, detached from Navy Yard, Boston, and placed on waiting orders.
Asst. Surgeon F. G. Braithwaite, ordered to receiving ship "Wabash," at Navy Yard, Boston.
Asst. Surgeon J. B. Uric, detached from receiving ship "Wabash," and to the Marine Rendezvous, Boston.
P. A. Surgeon F. J. B. Cordeiro, detached from Naval Hospital, Chelsea, Mass., and granted two months' leave of absence.
P. A. Surgeon G. McC. Pickerell, from hospital, New York, to hospital, Chelsea.

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No. 8

ORIGINAL ARTICLES.

THE CORONER SYSTEM IN THE UNITED STATES.

Read in the Section of State Medicine, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY HENRY O. MARCY, M.D.,
OF BOSTON, MASS.

I am aware that the great body of the medical profession have regarded the coroner and his duties as a subject bearing only an indirect relation to the practice of medicine. It was not until 1877, when the coroner laws were pretty thoroughly investigated in Massachusetts, that I believed they demanded revision.

The investigation of the law as practiced in Massachusetts showed clearly that it was not adapted to the best ends of justice; that the coroner, no matter how skilled in any branch of special training, could, under the law, scarcely be expected to discharge his duties in a satisfactory manner. In other words, that the primal fault lay, not so much in the functionary as in the class of duties he was expected to fulfill. The analysis of these duties showed that the same person was expected to be competent as a medical expert, to serve as an administrator of the law, as a judge to hear evidence, to decide upon its admissibility, he being also a witness in the case. Upon his own authority, or assisted by a physician, he was first to determine in a case under investigation if death had occurred by natural means or by violence; that is, by the evil intent of another. It having been decided that further investigation was necessary, a jury was summoned, and testimony was taken, usually in open session. To this he added his own testimony.

From this brief review it will be clearly observed that the office demanded two entirely distinct classes of functions to be discharged by one and the same person. These duties were both legal and scientific, and each in turn might involve questions of the greatest magnitude, often requiring the highest skill and experience in two great branches of learning. A further investigation showed that in matter of fact the office

was generally regarded as political, and that the appointees were more commonly men versed neither in law or medicine, and, as a consequence, were necessarily unfitted for the proper discharge of either of the main subdivisions of their duties. This was brought so clearly to the notice of the proper authorities that the manifest unfitness of the law for the complex requirements of modern life was plainly apparent, and Massachusetts abolished her entire system of coroner laws, and established in their place provision for medical examinations and inquest in cases of death and violence. This reformation was accomplished under the leadership of Mr. Theodore H. Tynedale, a member of the Boston bar, with the active coöperation of several distinguished members of our own profession, aided by the State Medical Society, and the law which is here given in full was adopted by the Legislature of Massachusetts in May, 1877:

AN ACT to Abolish the Office of Coroner, and to Provide for Medical Examinations and Inquest in Cases of Death by Violence.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same as follows:

SECTION 1. The offices of coroner and special coroner are hereby abolished.

SEC. 2. The Governor shall nominate, and by and with advice and consent of the council shall appoint, in the county of Suffolk, not exceeding two, and in each county not exceeding the number to be designated by the county commissioners as hereinafter provided, able and discreet men, learned in the science of medicine, to be medical examiners; and every such nomination shall be made at least seven days prior to such appointment.

SEC. 3. In the county of Suffolk, each medical examiner shall receive in full for all services performed by him an annual salary of three thousand dollars, to be paid quarterly from the treasury of said county; and in other counties they shall receive for a view without an autopsy, four dollars; for a view and autopsy, thirty dollars, and travel at the rate of five cents per mile to and from the place of the view.

SEC. 4. Medical examiners shall hold their offices for the term of seven years from the time of appointment, but shall be liable to removal from office at any time by the Governor and council for cause shown.

SEC. 5. Each medical examiner, before entering upon the duties of his office, shall be sworn and give bond, with sureties, in the sum of five hundred dollars, to the treasurer of the county, conditioned for the faithful performance of the duties of his office. If a medical examiner neglects or refuses to give bond as herein required, for the period of thirty days after his appointment, the

same shall be void, and another shall be made instead thereof.

SEC. 6. The county commissioners in each county shall, as soon as may be after the passage of this act, divide their several counties into suitable districts for the appointment of one medical examiner in each district under this act; and when such division is made, shall at once certify their action to the secretary of the Commonwealth, who shall lay such certificate before the Governor and council. But nothing herein shall prevent any medical examiner from acting as such in any part of his county.

SEC. 7. Medical examiners shall make examinations as hereinafter provided, upon the view of the dead bodies of such persons only as are supposed to have come to their death by violence.

SEC. 8. Whenever a medical examiner has notice that there has been found, or is lying within his county, the dead body of a person who is supposed to have come to his death by violence, he shall forthwith repair to the place where such body lies and take charge of the same; and if, on view thereof, and personal inquiry into the cause and manner of the death, he deems a further examination necessary, he shall, upon being thereto authorized in writing by the district attorney, mayor, or selectmen of the district, city or town where such body lies, in the presence of two or more discreet persons, whose attendance he may compel by subpoena, if necessary, make an autopsy, and then and there carefully reduce or cause to be reduced to writing every fact and circumstance tending to show the condition of the body, and the cause and manner of death, together with the names and addresses of said witnesses, which record he shall subscribe. Before making such autopsy, he shall call the attention of said witnesses to the position and appearance of the body.

SEC. 9. If, upon such view, personal inquiry or autopsy, he shall be of opinion that the death was caused by violence, he shall at once notify the district attorney and a justice of the district, police or municipal court for the district or city in which the body lies, or a trial justice, and shall file a duly attested copy of the record of his autopsy in such court, or with such justice, and a like copy with such district attorney; and shall in all cases certify to the clerk or registrar having the custody of the records of births, marriages and deaths in the city or town in which the person deceased came to his death, the name and residence of the person deceased, if known, or a description of his person as full as may be for identification, when the name and residence cannot be ascertained, together with the cause and manner in and by which the person deceased came to his death.

SEC. 10. The court or trial justice shall thereupon hold an inquest, which may be private, in which case any or all persons other than those required to be present by the provisions of this chapter may be excluded from the place where the same is held; and said court or trial justice may also direct the witnesses to be kept separate, so that they cannot converse with each other until they have been examined. The district attorney, or some person designated by him, may attend the inquest, and may examine all witnesses. An inquest shall be held in all cases of death by accident upon any railroad, and the district attorney or the attorney-general may direct an inquest to be held in the case of any other casualty from which the death of any person results, if, in his opinion, such inquest is necessary or expedient.

SEC. 11. The justice or district attorney may issue subpoenas for witnesses, returnable before such court or trial justice. The persons served with such process shall be allowed the same fees, and their attendance may be enforced in the same manner, and they shall be subject to the same penalties as if served with a subpoena in behalf of the Commonwealth in a criminal prosecution pending in said court or before said trial justice.

SEC. 12. The presiding justice or trial justice shall,

after hearing the testimony, draw up and sign a report in which he shall find and certify when, where, and by what means the person deceased came to his death, his name, if known, and all material circumstances attending his death; and if it appears that his death resulted wholly or in part from the unlawful act of any other person, he shall further state, if known to him, the name of such person, and of any person whose unlawful act contributed to such death, which report he shall file with the records of the superior court in the county wherein the inquest is held,

SEC. 13. If the justice finds that murder, manslaughter, or an assault has been committed, he may bind over, as in criminal prosecutions, such witnesses as he deems necessary, or as the district attorney may designate, to appear and testify at the court in which an indictment for such offense may be found or presented.

SEC. 14. If a person charged by the report with the commission of any offence is not in custody, the justice shall forthwith issue process for his apprehension, and such process shall be made returnable before any court or magistrate having jurisdiction in the premises, who shall proceed therein in the manner required by law. But nothing herein shall prevent any justice from issuing such process before the finding of such report if it be otherwise lawful to issue the same.

SEC. 15. If the medical examiner reports that the death was not caused by violence, and the district attorney or the attorney-general shall be of a contrary opinion, either the district attorney or the attorney-general may direct an inquest to be held in accordance with the provisions of this act, notwithstanding the report, at which inquest he, or some person designated by him, shall be present and examine all the witnesses.

SEC. 16. The medical examiner may, if he deems it necessary, call a chemist to aid in the examination of the body, or of substances supposed to have caused or contributed to the death, and such chemist shall be entitled to such compensation for his services as the medical examiner certifies to be just and reasonable, the same being audited and allowed in the manner herein provided. The clerk or amanuensis, if any, employed to reduce to writing the results of the medical examination or autopsy shall be allowed for his services two dollars per day.

SEC. 17. When a medical examiner views or makes an examination of the dead body of a stranger, he shall cause the body to be decently buried; and if he certifies that he has made careful inquiry, and that to the best of his knowledge and belief the person found dead is a stranger, having no settlement in any city or town of this Commonwealth, his fees with the actual expenses of burial shall be paid from the treasury of the Commonwealth. In all other cases the expenses shall be paid by the city or town, and all other expenses by the county wherein the body is found.

SEC. 18. When services are rendered in bringing to land the dead body of a person found in any of the harbors, rivers, or waters of the Commonwealth, the medical examiner may allow such compensation for said services as he deems reasonable, but this provision shall not entitle any person to compensation for services rendered in searching for such dead body.

SEC. 19. In all cases arising under the provisions of this act, the medical examiner shall take charge of any money or other personal property of the deceased, found upon or near the body, and deliver the same to the person or persons entitled to its custody or possession; but if not claimed by such person within sixty days, then to a public administrator, to be administered upon according to law.

SEC. 20. Any medical examiner who shall fraudulently neglect or refuse to deliver such property to such person within three days after due demand upon him therefor, shall be punished by imprisonment in the jail or house of correction not exceeding two years, or by fine not exceeding five hundred dollars.

SEC. 21. The medical examiner shall return an account of the expenses of each view or autopsy, including his fees, to the county commissioners having jurisdiction over the place where the examination or view is held, or in the county of Suffolk to the auditor of the city of Boston, and shall annex thereto the written authority under which the autopsy was made. Such commissioners or auditor shall audit such accounts, and certify to the treasurer of the Commonwealth, or the treasurer of the county, as the case may be, what items therein are deemed just and reasonable, which shall be paid by said treasurer to the person entitled to receive the same.

SEC. 22. Whenever any sheriff is a party to a suit or proceeding, or otherwise disqualified to act therein, the sheriff or a deputy sheriff of any adjoining county may serve and execute all writs and precepts, and perform all duties of such sheriff which he is disqualified to perform, and may serve and execute all such writs and precepts wherein any county, town, parish, religious society, or school district is a party or interested, notwithstanding he is at the time a member of such corporation.

SEC. 23. Whenever a vacancy occurs in the office of sheriff of any county, the senior deputy-sheriff in service shall perform all the duties required by law to be performed by the sheriff, until the office of sheriff is filled in the manner required by law, giving bond as now required by law of sheriffs. And in case of such vacancy, the deputies of the sheriff vacating the office shall continue to have and exercise the power of deputy sheriffs until said office is filled as aforesaid.

SEC. 24. Sections seventy-five, seventy-six and seventy-seven of chapter seventeen, and section one hundred of chapter sixty-three, and section eighteen of chapter one hundred and sixty-three of the General Statutes are hereby amended by substituting for the word "coroner," wherever the same occurs, the words "medical examiner," and for the word "coroners" the words "medical examiners." The second clause of section fifty-two, and sections seventy-four, seventy-eight, seventy-nine and eighty of chapter seventeen of the General Statutes, chapter one hundred and seventy-five of the General Statutes, chapter one hundred and thirteen of the acts of year eighteen hundred and sixty-one, chapter one hundred and seventy-two of the acts of the year eighteen hundred and sixty-two, chapter twenty-eight of the acts of the year eighteen hundred and sixty-four, chapter two hundred and forty-one of the acts of the year eighteen hundred and seventy-one, and chapter one hundred and fifteen of the acts of the year eighteen hundred and seventy-six, and all other acts and parts of acts inconsistent herewith are hereby repealed.

SEC. 25. For the purposes of the appointment and qualification of medical examiners and the action of the county commissioners herein provided for, this act shall take effect upon its passage, and it shall take full effect on the first day of July next.

We shall have occasion to revert to the experience of Massachusetts during the last thirteen years to show the advantages in the working of the new law. Suffice it to state in passing, that the radical changes made in this Act are: first, the doing away entirely with the office of coroner; second, the abandonment of examination by a jury on what is necessarily a preliminary trial; third, the adoption of a new plan by which a specially trained medical expert makes a scientific investigation, and properly qualified legal officials conduct the legal inquiry, preliminary to the final trial after indictment of the accused parties.

In 1881, Dr. John G. Lee, of Philadelphia,

published a book entitled "Hand-book for Coroners," containing a digest of all the coroner laws in the United States. This valuable work consists of the selection, collation and arrangement of such material as the author could command, and is offered especially "as a guide for the instruction of newly elected coroners, or as a convenient hand-book for occasional and rapid reference." It does not appear to the author that any especial criticism should be made upon the laws as collated, or that there is an imperative need of a radical revision of the same. He recognizes, however, that there is often a difficulty of proper adjustment of the relation which the coroner holds to the prosecuting attorney and the other departments of justice, and concludes by saying: "If the coroner will administer his office fearlessly and according to the laws of his state, we feel sure that the clamor which periodically demands the abolition of the coroner and his functions will be heard no more."

However, the impartial critic who studies at all carefully the coroner laws as they exist in the several states would seem to require no better evidence of the need of their revision than therein contained, and as if in emphasis of this conclusion, the author adds a considerable number of pages of anecdotes full of grim humor which would be high comedy were it not for the seriousness of the subject.

In 1887 a committee was appointed by the American Medical Association, of which I was chairman, to examine into and report upon the coroner system of the United States. The first report of this committee was made at the May meeting, in 1888, supplemented by a report at the annual meetings of 1889 and 1890. At the last meeting a resolution was adopted in the general session calling the attention of the various State and district societies to this subject, requesting the members of the Association to personally investigate, and as far as possible to correct the evils inherent in the present system.

I desire by this paper to enlist the interest of the profession generally in this subject, as one eminently suitable for their investigation, and I sincerely trust that the influence of this learned body may be exercised in behalf of a much needed reform. It had been my purpose to examine in detail the laws in effect in each of the several States and Territories, and to this end I entered into correspondence with the secretaries of the various boards of health, and other prominent officials, and I have, as the result therefrom, collected a large amount of valuable material. However, the limit of this paper prevents an analysis in detail. The essential principles of the coroner laws (except in Massachusetts, Connecticut and Rhode Island) are very similar in all the States, and it is a source of absolute wonder how such an absurd and valueless office for

the detection of crime should have continued through all these years.

These laws owe their origin very naturally to the laws of England, and were first adopted in the early colonial days. The conservatism of English thought is nowhere better exemplified than in the history of her legal enactments. The primary medico-legal inquiry in cases of death by violence has been conducted in England by the coroner's inquest for the last thousand years, and has not been essentially changed for several centuries. According to Sir Thomas Smith, who wrote in 1583, the name of the office originated from the word "Crownier," or "Coromator," because "the death of every subject by violence is accounted to touch the Crowne, and to be a detriment to it; in other words, the coroner was a representative of the Crown." The system of trial by jury has ever been very dear to the English heart, and this, in the earlier days of English history, when society was less complex than at present, was very properly associated with the duties of the coroner system. Then both pathology and chemistry were in their infancy, and the combined judgment of the average citizen represented the highest verdict of public opinion.

In the early part of the present century, Mr. Thomas Wakeley, the able editor of the *London Lancet*, pointed out the inefficiency of the coroner laws as practiced in England, and demanded that the office of coroner should be filled by a competent medical man, since which time the coroner in England has usually been selected from among the better class of medical practitioners.

At the present time, in nearly all the States of the Union, the coroner's office is considered one of political preferment, and as such, is subject to party politics, holding the office not seldom as a subsidy for supposed services rendered, rather than because of fitness to discharge duties of so great importance to the State.

In the progress of legal learning, as well as in medical science, these two great branches of special-knowledge have outgrown their former status, and to be well versed in both is beyond the training and education of the present generation.

The object of a medico-legal inquiry is manifestly the detection of crime, and the evidence sought is the direct cause of death and the identity of the individuals committing the crime. To ascertain the cause of death, it often requires the highest qualification of a pathological expert. The post-mortem examination must often be made in a thorough and skillful manner, and must frequently be supplemented by a careful and exhaustive chemical research. To this portion of the subject an especially trained medical expert limits his inquiry. Here, in the large majority of cases requiring investigation, the examination should end, since by it, it is clearly determined that death has been due to natural

causes, and that the case does not come within the limit of criminal investigation. In such cases, at least, it is a useless and unnecessary expense to summon jurymen, and too often calls the attention of the public through the press to a subject keenly painful to all parties involved.

If death has not occurred from natural causes, the question then arises, has a crime been committed? In all doubtful cases, the evidence of this is largely determined by a careful, competent, and thorough medical examination. When this has been fairly established, the further investigation of the relation of "the party or parties to the act" becomes a purely legal one, and here, singularly, the evidence, as usually rendered by the verdict of a coroner's jury, is generally considered of little value. In an able article¹ by Mr. Clark Bell, of New York, entitled "The Coroner's Office; Should it be Abolished?" he writes: "There can probably be no more startling evidence of the utter uselessness of a coroner's jury than the statement of this fact, that whatever may be the verdict in a given case, the subsequent indictment, trial, and entire judicial proceeding is absolutely independent of it, and proceeds as if the coroner's jury had never acted at all. . . .

"We cannot be too jealous of the right of trial by jury, but in all cases under existing law two juries must agree before any person can be convicted of crime, without counting the coroner's jury, viz: the grand jury which presents the indictment, and the jury in the trial of the accused after indictment; so that the abolition of the jury on the preliminary inquiry, and a change as to who shall make the inquest in its stead, is not in any sense true an infringement upon the right of trial by jury which in all cases would exist if the proposed change was made."

Under the coroner system, as in actual use in the various States, much time is frequently lost by reversing what seems the proper order of procedure. A jury is summoned, witnesses are heard, and at last it is determined that a post-mortem examination is necessary, and yet, it is often of the greatest importance that the autopsy be promptly made, before decomposition is pronounced.

In a subject the fundamental principles of which are of universal application, it may be well to broaden the inquiry as to the methods adopted by the great nations of Europe which cover the important duties relegated to the coroner's inquest in England and America. For an excellent résumé of the same, I take pleasure in making reference to the valuable articles of Mr. Bell from which I have just quoted.

FRANCE.

In France two distinct and separate officers

¹ The Medico-Legal Journal, September, 1890.

take charge of all medico-legal investigations. The legal officer, attorney of the republic, is an authority not unlike the district attorney of our States. He makes a record of evidence, has the power of seizing articles or papers if connected with crime, and can temporarily hold in durance suspected persons. He may employ detectives, and is held responsible for all the legal questions involved. The scientific investigation is under the charge of a competent medical expert, especially selected for the office, who has full power, and is held responsible for a careful, scientific investigation.

GERMANY.

The present law of the German Empire was adopted in 1879. The judicial officer (*staatsanwalt*) is called the district attorney. The police are his subordinates as officers of the law in the investigation of crime. They are obliged to report to this officer all cases of sudden death or death by violence, and no interment of the body is allowed until after the consent has been obtained from this officer or a competent court. Medical examinations are made by experts especially selected for this purpose, who are summoned by the above mentioned authorities, and they in all respects conduct the examination. Upon the evidence of the preliminary examination, the district attorney enters suit before a competent court.

SCOTLAND.

The law in Scotland is analogous to that of France.

GREECE.

The system in force in Greece is almost identical with that of France. A medical officer takes exclusive charge of the medical question of the examination, and detectives, or experts trained to the business, are subject to the call of the prosecuting officer.

RUSSIA.

The officer designated in charge of the medico-legal examinations is known as judge of the institute; is an officer of the Crown, appointed in and for each district by the central governor or council of the province or state. He is possessed of large powers, and may even place in close confinement an accused or suspected person. The medical side of the case is in charge of a physician who is a salaried officer under the Crown. He conducts autopsies, and carefully reduces his examination and conclusions to writing, which he furnishes to the court, and also to the central medical council, or board, held in every province at the seat of the government, who have a power of review of the same in case doubt exists.

In 1883 a new law was enacted in Connecticut, appointing a properly qualified attorney as a coroner for each county, and a medical examiner for each town. I quote briefly from a letter written

me upon the subject by Dr. M. C. White, medical examiner for New Haven: "One feature of our new law, giving all the business of the county to one lawyer, secures immediate investigation by an experienced officer who understands law and the best methods of examining witnesses. . . . He must investigate immediately all suspicious cases. He may call a jury. All this works admirably. Three-fourths of all the sudden, violent or untimely deaths are disposed of by the medical examiners, reported and recorded, but require no legal investigation, since there is no suspicion of crime. . . . After nearly five years experience under the present law, I think the defects or questionable points are so few that we may say there is very general satisfaction with the law."

Rhode Island somewhat recently passed laws similar to those of Massachusetts, and Dr. Chas. H. Fisher, secretary of the State Board of Health, writes me "that it is a great improvement upon the preceding law and methods."

I am indebted to Dr. Samuel W. Abbott, the efficient secretary of the Massachusetts Board of Health, for most valuable information upon the working of the law as enforced in this State since 1877. I take pleasure in referring to a valuable article published by Dr. Abbott in the *Forum* for 1889, entitled "The Defects of the Coroner System." Under the new régime, about 15,000 cases of death from sudden, suspicious, violent or unknown causes have been investigated in a manner much more satisfactory than was possible under the old system. "Another important feature of the new method of procedure is the decided lessening of expense. Under the coroner system, the cost of executing the law for three years (1874, 1875, 1876) was found to be \$63,712.04, and under the new law it was \$54,509.31 for the three years (1878, 1879, 1880), a decrease of \$9,202.73, or more than three thousand dollars per year, notwithstanding an increase in the population of about eight per cent. The principal reasons for this diminished expense are found in the abolition of the jury, and in the decrease in the number of inquests. The ratio of inquests to cases investigated under the old law was forty per cent, while under the present law for the period of eleven years (1877-1888) it has been but twenty per cent, or half as many."

In review of the celebrated Barron case, in Maine, which created a wide interest outside of the State, Dr. Abbott wrote a valuable criticism, from which I quote. In the trial of one Stain, as having committed the murder, the chief question of interest was the uncertainty as to the exact cause of death: "The cashier of the Dexter bank was found dead in the vault of the bank under suspicious circumstances. Marks of violence were found upon his head. Two theories were advanced, and the little community of Dex-

ter became divided as to the question of murder or suicide. What would have been the most reasonable course to pursue under such circumstances? An immediate and thorough examination of the body, especially of the brain and stomach, would undoubtedly have settled the question of murder or suicide at once.

“What was actually done? The good-natured coroner (to use the words of the account printed at the time of the affair) deferred to the wishes of the family, and *made no autopsy*. Then came the farce of a coroner’s jury. Six men sat in solemn conclave and pronounced a verdict, and of what possible value was the verdict?”

From the advanced sheets of the report of the State Board of Health, Dr. Abbott furnishes me the following statistical table :

EXPENSES OF MEDICAL EXAMINATION FOR 1889.

The total expenses of the medical examinations for the year 1889, including the cost of registration, was \$19,489.69. The average cost of each of the 1,654 medical examinations was \$11.78. In Bristol, Essex, Hampden, Hampshire and Middlesex the expense was greater, and in the remaining counties it was less, than that of the previous year.

The expenses of the four years 1885–1889 were as follows :

YEAR.	Total Number of Cases Examined.	Autopsies.	Total Expenses.	Average Expense of Each Case.
1885	1,260	165	\$16,322.54	\$12.95
1886	1,378	202	18,024.22	13.08
1887	1,556	188	18,626.26	11.97
1888	1,651	219	19,611.53	11.88
1889	1,654	216	19,489.69	11.78

In the following itemized table are presented the expenses of conducting the medical examinations in each county and for the whole State, for the year 1888 :

Abolition of the Coroner in Massachusetts,” by T. H. Tyndale, Esq. :² “With the abolition of the composite functionary and of the jury, a highly-trained class of ‘medical examiners,’ an office gladly accepted by the first physicians in the State, we open the door for special interest in, and previously unknown penetration into, fields of detailed investigation of pathology; we have laid the foundation of a valuable body of observed facts, as shown by the publication of our Medico-Legal Transactions, contributed entirely by the medical examiners; we have attained accuracy, and we have never, since the passage of the Medical Examiner Act, failed in a single prosecution, for want, or insufficient clearness of the medical testimony. The previous statistics were—some hundreds of inquests annually—some tens of convictions. Now the great majority of prosecutions begin with the skillful investigation of trained men, acting promptly and delayed by no cumbersome, meaningless machinery, and end in convictions. . . . We have attained that greatest deterrent of crime, the chief terror to criminals—swiftness in discovery and certainty in punishment.

Incidentally, a gain dear to the lover of social cleanliness and morality has been obtained. I refer to the total disappearance from the press—except as news from other States—of the nauseous and offensive details formerly furnished by the coroner’s inquest, and eagerly sought after by the prurient curiosity mongers. These changes have been wrought by a simple act, abolishing the office of coroner, and appointing for Boston two, for each other county in the State some four medical examiners whose business is solely

Expenses incurred in conducting the Medical Examinations required by the Medical Examiner Laws of Massachusetts.—1889.

COUNTIES.	Number of Cases.	Autopsies.	Fees of Medical Examiners.	Mileage.	Witnesses and Clerks.	Chemists and Other Experts.	Burial, Removal, Recovery and Care of Bodies.	Incidentals.	Totals.
Barnstable	13	6	\$65.00	\$27.10	..	..	\$6.00	\$0.95	\$99.05
Berkshire	51	..	405.00	42.40	\$41.00	\$50.00	15.00	12.50	565.90
Bristol	132	7	835.00	59.40	58.00	160.00	26.00	10.40	1,148.80
Dukes	4	..	20.00	3.30	6.00	..	..	..	29.30
Essex	203	16	1,415.00	82.70	106.00	100.00	23.50	10.00	1,737.20
Franklin	15	..	75.00	24.30	..	..	..	..	99.30
Hampden	126	14	980.00	77.60	134.00	435.00	217.00	31.50	1,875.10
Hampshire	24	5	245.00	36.99	18.00	..	7.00	..	306.99
Middlesex	276	19	1,855.00	174.55	136.00	50.00	124.00	..	2,339.55
Nantucket	2	..	10.00	..	..	..	..	..	10.00
Norfolk	84	8	620.00	51.65	72.80	50.00	12.50	..	806.95
Plymouth	39	4	295.00	57.30	17.50	..	..	6.00	375.80
Suffolk	533	125	6,500.00	169.50	970.00	275.00	562.75	..	8,477.25
Worcester	152	12	1,060.00	115.10	113.00	..	100.50	..	1,388.60
Totals	1,654	216	14,380.00	\$921.89	\$1,672.30	\$1,120.00	\$1,094.25	\$71.35	\$19,259.79
Registration . . . . .	..	..	..	..	..	..	..	..	229.90
									\$19,489.69

In evidence of the great value of the working of the new law in Massachusetts, I quote from an exhaustive article upon the subject, “The

the physical examination and subsequent giving of testimony. . . . The new system has now

² The Medico-Legal Journal, March, 1890.

been in operation about twelve years, and has proved itself capable of exact and valuable work; no instance of willful dereliction of duty under it has taken place. It has now the commendation of judges, prosecuting officers, and the general public, and may fairly be pronounced a step in the direction of purifying the public service."

The limit of time at my disposal prevents a more detailed discussion of a subject of such vast importance, and in closing I desire to commend for earnest consideration in each of the several States the following propositions :

1. To abolish the office of coroner.
2. To dispense with jury service.
3. To separate the medical from the legal duties in all cases involving the examination into the causes of death where crime is suspected.
4. To entrust the medical examination only to competent medical officers properly trained in their work.
5. To make the number of these medical officers as small as consistent with the proper discharge of their duties.
6. To consign all questions of law only to properly qualified legal magistrates.
7. To remove the appointment of these officers entirely from the question of political consideration; and to be based only upon their possession of the requisite and proper qualifications.

Upon some basis of this character should the coroner's laws be revised. Much useless expenditure of time and money will be avoided, often great sorrow and anxiety will be prevented, and that which is of vastly greater importance, the ends of justice will be far better served.

SICKNESS AND MORTALITY IN THE

ARMY OF THE UNITED STATES.

Read in the Section of State Medicine, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY JOS. R. SMITH, A.M., M.D.,

COLONEL AND SURGEON, U. S. ARMY; MEDICAL DIRECTOR DEPARTMENT OF ARIZONA.

All statistics telling the amount of disease and death in any considerable portion of the community, and showing the variations in said amount from year to year, seem properly to belong to State Medicine.

As there is no Section of military medicine and surgery in the American Medical Association, I deem it proper to present to the Section on State Medicine the following paper, in which I have collated and compared figures showing the absolute and relative amount of disease, death, and non-effectiveness in the Army of the United States.

While these statistics have been collected under conditions of considerable uniformity from year to year, yet it is to be remarked, that they

have been collected by a large number of observers, all of them medical officers of education and intelligence, yet each differing from the other in powers of observation, and in mental characteristics or peculiarities.

To some, this last named fact will make the statistics more reliable and valuable, than if they had been collated and reported by a single individual; to others, less reliable and valuable.

In 1882, I presented to the American Medical Association a paper which was printed in its Transactions, and contained the health statistics of the U. S. Army for eleven years—from 1871 to 1881 inclusive.

I now present similar data from the annual reports of the Surgeon-General for a period of nine years, from 1882 to 1889 inclusive.

TABLE I,

Showing the Sickness and Mortality from Disease in the Army of the United States during the years 1882-1889, inclusive.

YEAR ENDING	Cases per M. of mean strength reported as taken on sick report for disease.			Deaths from disease per M. of mean strength.			Deaths from disease per M. of cases of disease treated.		
	White.	Colored.	Total.	White.	Colored.	Total.	White.	Colored.	Total.
June 30, 1882	1461	1537	1468	6.79	7.06	6.81	4.65	4.60	4.64
" " 1883	1570	1620	1575	6.98	6.28	6.91	4.45	3.87	4.39
" " 1884	1583	1558	1580	8.80	6.50	8.56	5.56	4.17	5.42
Dec. 31, 1884	1236	1458	1257	7.27	9.15	7.45	5.88	6.28	5.92
" " 1885	1110	1203	1118	4.92	3.19	4.76	4.43	2.65	4.26
" " 1886	1017	1236	1036	6.53	4.67	6.36	6.43	3.78	6.14
" " 1887	992	1094	1002	6.02	8.48	6.25	6.06	7.76	6.24
" " 1888	1013	1164	1028	6.05	11.59	6.59	5.97	9.95	6.41
" " 1889	1073	997	1066	3.98	7.45	4.32	3.71	7.47	4.05
Total for whole period of nine years	1222	1319	1231	6.33	7.20	6.42	5.18	5.47	5.21
Total in former Reports for eleven yrs.	1551	1498	1546	8.45	11.40	8.71	5.45	7.61	5.63

The number taken sick or dying from disease, and the number constantly sick at different times, are both, in their own way, measures of the health of an army; each has its own peculiar value.

The difference between the numbers admitted on sick report for disease in the two periods tabulated in 1882 and now, might be due to difference of physique of the soldiers, to differences in the nature of their service, and to differences in the sanitary care and attention bestowed upon them.

So far as can be discovered, the material in both periods was about the same; the nature of the service was unchanged. So, reasoning by exclusion, better sanitary care and attention must have been mainly or entirely operative in causing the decrease of numbers taken sick during the period 1882 to 1889 inclusive.

Differences in the ratios of those dying from disease (not injury) per 1,000 of mean strength, might be due to these above named causes, and, in addition, to a difference in the character or constitution of each individual disease, and to better therapeutics.

As before, the first two causes may be excluded. A difference in the character of the diseases has not been proved, or even asserted; rest, the improvements in sanitation and therapeusis, as the effective factors.

The difference in the ratio of those dying from disease per 1,000 of cases of disease, would seem, besides the above named causes, specially due to either a difference in the character of the disease; that is, a greater or less tendency to death, or to better treatment, these two being either combined or complementary; one more efficient as the other is less so.

The importance of the ratios of constant non-effectiveness as a measure of comparative health, was first emphasized by the Surgeon-General of the Army in his report for 1888. The writer of the pages in that report, on the health of the Army as a whole, says: "The actual impairment of force which the Army suffers on account of sickness, as well as the relative importance of the various causes of sickness, cannot be measured with any degree of accuracy by the number of admissions to sick report, but they are shown very clearly by the aggregate loss of time which these admissions individually and collectively cause, and from this aggregate the average non-effectiveness can be accurately and readily determined."

So it is desirable to consider these data, and I have accordingly constructed a new table, containing figures relating to non-effectiveness. I have also added the ratios of "deaths from all causes," the foregoing tables including only those from disease. It is apparent that the difference between the ratios of deaths from disease, and deaths from all causes, is the ratio of deaths from injury, violence, etc.

I have deemed it best also to add the figures for some years preceding 1871—and I have commenced with 1867, because during that year the Army was reduced from a war to a peace footing, and because in that year appeared first the statistics of average or mean strength (termed in the reports "average" for the years 1867, 1868, 1869, 1886, 1887, 1888 and 1889, and "average mean" for other years), the number taken on sick report for disease, the number taken on sick report for injury, the mortality, and the constant sickness rate, all for whites and blacks separately, for the fiscal year ending June 30, to which year the rest of the report refers. Similar data have appeared in each annual report since, until 1885.

In the annual report dated October 1, 1885, and subsequent annual reports of the Surgeon-General, while the rest of the report refers to the previous fiscal year, ending June 30, the health statistics relate to the calendar year next preceding.

TABLE II.

YEAR ENDING	Ratio, per M. of mean strength, admitted for disease.			Ratio of deaths from disease, per M. of mean strength.			Ratio of deaths from disease, per M. admitted for disease.			Ratio of deaths from all causes, per M. of mean strength.			Ratio of deaths from all causes, per M. of admissions for all causes.			Ratio constantly sick, per M. of mean strength.		
	White.	Colored.	Total.	White.	Colored.	Total.	White.	Colored.	Total.	White.	Colored.	Total.	White.	Colored.	Total.	White.	Colored.	Total.
June 30, 1867	2717	2865	2737	37.15	114.46	47.79	13.68	39.95	17.46	40.92	120.71	51.90	13.77	40.22	17.44	58.00	45.00	57.00
" 1868	2628	2838	2648	25.96	50.69	28.32	9.88	17.86	10.70	29.90	56.14	32.40	10.28	18.34	11.09	63.02	59.28	62.66
" 1869	2320	1859	2272	9.89	12.67	10.17	4.26	6.81	4.48	12.85	17.59	13.34	4.96	8.43	5.26	58.17	52.78	57.61
" 1870	1855	1608	1829	8.58	14.97	9.25	4.63	9.31	5.06	12.89	19.37	13.57	5.98	10.63	6.40	48.89	52.25	49.25
" 1871	1863	1137	1804	12.36	10.74	12.23	6.63	9.44	6.78	17.67	18.80	17.77	8.17	13.80	8.47	50.40	39.88	49.54
" 1872	1671	1178	1624	11.12	17.64	11.73	6.65	14.97	7.22	15.23	21.65	15.83	7.71	15.37	8.24	50.50	41.30	49.63
" 1873	1666	1438	1645	9.90	18.25	10.67	5.94	12.69	6.48	16.58	21.03	16.99	8.45	12.31	8.76	49.07	48.41	49.01
" 1874	1514	1539	1515	8.92	10.01	9.02	5.89	6.51	5.95	13.30	14.82	13.43	7.43	8.16	7.49	46.40	52.06	46.90
" 1875	1420	1417	1419	7.39	13.34	7.95	5.21	9.42	5.60	10.92	16.47	11.43	6.49	9.79	6.79	43.11	49.84	43.74
" 1876	1499	1469	1496	8.30	7.99	8.28	5.54	5.44	5.53	23.89	12.99	22.97	13.79	7.51	13.26	43.49	51.95	44.21
" 1877	1482	1821	1510	7.73	7.23	7.69	5.21	3.97	5.09	11.17	15.42	11.51	6.47	7.36	6.56	44.06	47.71	44.36
" 1878	1270	1607	1298	5.82	10.03	6.17	4.58	6.24	4.75	12.31	16.89	12.69	8.27	9.31	8.37	41.45	41.69	41.47
" 1879	1505	1775	1527	7.46	7.70	7.48	4.95	4.34	4.89	12.25	14.38	12.42	7.04	7.12	7.04	44.44	39.55	44.03
" 1880	1519	1512	1518	5.70	8.87	6.01	3.75	5.86	3.96	9.91	19.43	10.83	5.60	11.35	6.14	44.62	37.58	43.93
" 1881	1513	1745	1536	6.14	11.09	6.64	4.06	6.35	4.32	9.31	20.48	10.42	5.27	10.32	5.83	44.05	45.22	44.16
" 1882	1461	1537	1468	6.79	7.06	6.81	4.65	4.60	4.64	10.40	11.04	10.46	6.19	6.10	6.18	45.34	44.15	45.22
" 1883	1570	1620	1575	6.98	6.28	6.91	4.45	3.87	4.39	10.23	10.88	10.30	5.68	5.54	5.66	47.48	40.59	46.77
" 1884	1583	1558	1580	8.80	6.50	8.56	5.56	4.17	5.42	12.36	9.53	12.07	6.74	5.05	6.57	49.58	43.74	48.98
Dec. 31, 1884	1236	1458	1257	7.27	9.15	7.45	5.88	6.28	5.92	10.72	13.07	10.94	7.10	7.45	7.14	44.02	48.80	44.48
" 1885	1110	1203	1118	4.92	3.19	4.76	4.43	2.65	4.26	7.66	6.38	7.54	5.66	4.24	5.52	40.92	42.39	41.06
" 1886	1017	1236	1036	6.53	4.67	6.36	6.43	3.78	6.14	9.94	7.94	9.76	8.02	5.29	7.73	39.01	43.42	39.41
" 1887	992	1094	1002	6.02	8.48	6.25	6.06	7.76	6.24	8.70	11.61	8.98	7.07	8.31	7.20	42.04	44.07	42.38
" 1888	1013	1164	1028	6.05	11.59	6.59	5.97	9.95	6.41	8.16	14.90	8.82	6.53	10.17	6.94	41.62	44.56	41.90
" 1889	1073	997	1066	3.98	7.45	4.32	3.71	7.47	4.05	6.55	10.34	6.92	4.97	8.07	5.26	44.44	41.09	44.12

TABLE III.

For the four years, 1867 to 1870, inclusive . . .	2420	2407	2427	21.78	57.77	26.78	8.96	24.00	10.62	25.51	63.19	29.69	9.43	24.31	11.02	57.80	50.93	57.04
For eleven years, 1871 to 1881, inclusive . . .	1551	1498	1546	8.45	11.40	8.71	5.45	7.61	5.63	14.01	17.68	14.34	7.72	10.15	7.93	45.85	45.01	45.77
For nine years, 1882 to 1889, inclusive . . .	1222	1319	1231	6.33	7.20	6.42	5.18	5.47	5.21	9.36	10.69	9.49	6.40	6.61	6.43	43.76	43.84	43.77
For whole period of twenty-four years . .	1667	1708	1671	11.14	23.69	12.35	6.68	13.87	7.39	15.42	28.82	16.72	8.02	14.74	8.67	44.10	42.45	43.93

This and subsequent reports also fail to give the constant sickness rates for disease and injury separately. No reason was given for these changes, nor is one apparent which is entirely satisfactory.

In consequence of them, accurate, rigorous comparison is prevented between figures of preceding and subsequent reports, and the report referred to embraces statistics for six months common to it and the previous report.

Consequent on these omissions, my table does not contain the non-effective rates for disease and injury separately, but the rate for both combined.

This same report of the Surgeon-General, for the first time gives data as to the number of days' service lost in consequence of admissions to sick report.

Explanatory of some of the figures in these tables, the text of the reports of the Surgeon-General states that 1,310 deaths from cholera occurred in 1867.

That cholera and yellow fever combined caused 681 deaths in 1868, and that yellow fever to a limited extent occurred in 1869, 1874, 1875, 1876, 1877, 1878, 1883 and 1884.

The text states that for the year 1870, "the comparatively large mortality from wounds, accidents and injuries, is explained by the Indian hostilities;" and it shows the same, in 1876, to be mainly due to the Custer massacre.

For the year ending June 30, 1884, the text reads: "It is interesting to note that not only is this the lowest death rate yet reached among colored troops since their organization, but it is the first time that the rate has fallen lower than that for white troops, the usual average difference being 3.2 per thousand of mean strength in favor of the latter class."

For the year 1885, the text says: "It is a matter of congratulation that not only the admission rate for the troops, but also the death-rate, has fallen to a lower point than at any time within the history of the Medical Department."

I remark here that my tables show that, for the succeeding years 1886, 1887, 1888 and 1889, the admission rates, though not the death-rates, for all causes, were still lower.

In the report for the year ending December 31, 1884, the text of the report of the Surgeon-General mentions the "mean strength" obtained from the reports of the Adjutant General of the Army, which varies from the "mean strength" obtained from the reports of medical officers from which all preceding rates had been calculated. The text says that the death and discharge rates in these tables, so calculated, are "higher than they should be," as the figures given by medical officers do not embrace the whole strength of the Army. The subject was only considered of enough importance to be mentioned in a foot-note merely, and it is so mentioned in a foot-note in the report of the ensuing year.

In the report for 1886, the matter is more fully treated of, and the difference between the two "mean strengths" is fully recognized, that given by medical officers being generally the smaller.

The reason is shown why the "mean strength" reported by the Adjutant General is the proper strength from which to calculate ratios of deaths and discharges, and these ratios are, in the 1886 and subsequent reports, calculated from the figures of the Adjutant General, while rates of admission and non-effectiveness are calculated from the figures of mean strength given by medical officers—the same is the case for succeeding years.

It may here be remarked that, from many points of view, this report of 1886 shows a distinct advance beyond its predecessors.

It is manifest that for purposes of comparison within themselves, the ratios of all reports must be calculated on similar data, and those data given.

As the data given in the reports before 1886 will not enable us to calculate ratios for these years on the figures of the Adjutant General, I have used for the ratios of every year in tables II and III, the figures given by medical officers.

The exact difference between these two "mean strengths" appears below, the figures being taken from all the annual reports of the Surgeon-General which give such figures.

MEAN STRENGTH OF ARMY.

YEAR.	White.		Colored.		Total.	
	By Returns from A. G. O.	By Reports of Medical Officers.	By Returns of A. G. O.	By Reports of Medical Officers.	By Returns of A. G. O.	By Reports of Medical Officers.
1884	23,737	21,430	2,358	2,142	26,124	24,033
1885	23,937	21,601	2,428	2,240	26,542	24,138
1886	24,103	22,310	2,636	2,416	26,095	23,572
1887	24,723	22,591	2,610	2,417	26,365	23,841
1888					26,739	24,726
1889					27,333	25,008

The difference in the ratios computed from these main strengths is given below :

YEAR.	Ratio admitted for disease by figures from Returns of Medical officers, <i>vide</i> Table 2.	Same per Returns from A. G. O.	Ratio of deaths per M. of mean strength, from Reports of Medical Officers, <i>vide</i> Table 2.	Same from Returns from A. G. O.	Ratio of deaths from all causes per M. of mean strength, calculated from Reports of Medical Officers, <i>vide</i> Table 2.	Same from Returns from A. G. O.	Constantly sick, from Reports of Medical Officers, <i>vide</i> Table 2.	Same, from returns from A. G. O.
1884	1257	1157	7.45	6.85	10.94	10.02	44.48	40.92
1885	1118	1017	4.76	4.33	7.54	6.86	41.06	37.34
1886	1036	936	6.36	5.75	9.76	8.81	39.41	35.60
1887	1002	906	6.25	5.65	8.98	8.12	42.36	38.31
1888	1028	950	6.59	6.09	8.82	8.15	41.90	38.74
1889	1066	976	4.32	3.95	6.92	6.33	44.11	40.34

Since 1883, I have given much attention to the question of the correct mean strength of the Army. For many military posts, month after month, I have compared the figures in the reports of the Adjutant General, the figures given by medical officers, and the actual numbers on which these figures are based. It would take too much space to give all the grounds for my convictions, which I therefore merely recite, as follows:

As stated in the text of the report of the Surgeon-General for 1886, the figures in the report of the Adjutant General are the proper data on which to compute ratios of deaths and discharges.

But neither the mean strength given by the Adjutant General, nor that obtained from reports of medical officers, are correct for the calculation of ratios of admission and constant sickness.

The figures of the Post-Surgeon should be the basis with certain additions which have been habitually omitted, but which may be easily ascertained and which may in future be supplied.

In consequence of using the figures given by Post-Surgeons, without the corrections above indicated, for comparison with the statistics of other armies, all the ratios in Tables 2 and 3 are too high; and the amount of correction should be probably in accordance with the figures immediately preceding, which show the differences as computed by the different mean strengths.

In the report of the Surgeon-General for the year ending June 30, 1884, the number of cases of typhoid fever is given in the different arms of the service, and among recruits and older soldiers. No attempt is made to explain the differing conditions of these different arms; and as it will hardly be supposed that typhoid fever favors a man simply because he is a cavalry or artillery man, the remarks under this head are not of very great significance.

Elsewhere remarks are made as to the greater or less prevalence of this disease at various posts, where more or less unsanitary condition is also treated of.

The next annual report, 1885, again mentions the greater prevalence of the disease among cavalry men, and gives further details about the posts where prevalent.

Data are also given as to age and length of service of those affected.

In the same report appear tables to show the influence on mortality of rank, age, arm of service, race and nationality, and season of the year; also the relation of discharges for disability to arm of service, age, and season.

Data of a similar nature, more or less complete, appear in all subsequent reports.

The text of the report for 1889 speaks of the death rate as the lowest annual death rate in the history of the Army, and makes pertinent com-

ment on the effect produced by the number of discharges for disability on certain other health statistics of the Army.

On critical examination of the figures in Tables 2 and 3, it will be evident, that taking for a measure the admission ratios on account of diseases exclusive of injury, the figures are most favorable for the black troops for the period of four years, 1868-70 inclusive, and the period of eleven years 1871-81 inclusive; but most favorable for the white troops for the period of nine years 1882-9 inclusive, and the period of the whole twenty-four years.

Taking for our measure the mortality ratios the figures are most favorable for the white troops for each and every period given separately in Table 3.

Taking for our measure the non-effective rate the figures are slightly in favor of the whites for nine years, 1882-9 inclusive, and much more in favor of the blacks for all the other periods.

It farther appears that the death rates are more nearly equal for whites and blacks in the latter period of 9 years, 1882-9 inclusive, than in the preceding two periods. That is to say, the blacks are overtaking the whites in the race of which longevity is the goal.

As regards the admission ratios for disease and the ratios for non effectiveness, the white troops in the last period of nine years have overtaken and a little passed the blacks.

For obvious reasons, the general deductions from the figures relating to longer periods of service are more valuable than those from the figures relating to individual years; yet attention may be called to the fact that for the last year, 1889, the admission rate for disease and that for constant sickness are in favor of the black troops; while the mortality rates are considerably in favor of the white troops, while in general, the year, as regards vital statistics, was one of the best in the Army's history.

It will be further noticed that the indications from admission rate for disease, mortality rate, and constant sickness rate, are unanimously in favor of any one color but for seven years of the 24, viz: in 1874, 1878, 1881, 1885, 1887, and 1888, in favor of the white; in 1884 in favor of the black troops.

For about three-quarters of the years given, the health of the white troops has been the best, as measured by rate of admission for disease and death rate.

Measured by rate of non-effectiveness, the white troops have been less affected by disease than the blacks for twelve years, and the blacks less than the whites for twelve years.

The maximum admission rate for disease among the whites, viz.: 27.17 per thousand of mean strength, occurred in 1867; the minimum, 992, in 1887.

The maximum of the same rate among the colored troops, 28.65 per thousand, occurred in 1868; the minimum, 9.97, in 1889.

The maximum death rate per thousand of mean strength among the white troops, viz.: 37.15 occurred in 1867; the minimum 3.98, in 1887.

The maximum for the same rate among the colored troops, viz.: 114.46 per thousand, occurred in 1867; the minimum, 3.19, in 1885.

The maximum of non-effectiveness among the white troops, viz.: 63.02 per thousand, occurred in 1868; the minimum, 39.01 per thousand, in 1886.

The maximum of the same among colored troops, 59.28 per thousand, occurred in 1868; the minimum, 37.58, in 1880.

The maximum death rate for disease per thousand of cases of disease treated among the whites, viz.: 13.68 per thousand occurred in 1867; the minimum, 3.71, in 1889.

The maximum of same ratio among colored troops, viz.: 39.95 per thousand occurred in 1867; the minimum 2.65, in 1885.

I am unable in the reports of the Surgeon-General or elsewhere to find facts reported which adequately explain all the fluctuations in the figures of Tables 2 and 3, and without further remark I offer the foregoing figures and comments to the students of Army and other vital statistics, only adding that the figures given point unmistakably to the conclusion, that in the latter series of years tabulated, the amount of sickness and mortality was less than in the former series.

THE DUTY OF THE GOVERNMENT IN THE PREVENTION OF TUBERCULOSIS.

Read in the Section of State Medicine, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5, 1891.

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We read in the Declaration of Independence of the United States, "We hold these truths to be self-evident, that all men are created equal; that they are endowed by their Creator with certain unalienable rights; that among these are life, liberty, and the pursuit of happiness. That, to secure these rights, governments are instituted among men" All governments, indeed, which have been constituted upon the principles laid down in the great Magna Charta, have, as one of their foremost duties, the preservation of the lives and health of the people. The Common Law of England sums up the rights of individuals under three principal articles; namely: "the right of personal security, the right of personal liberty, and the right of private property;" and defines the right of per-

sonal security to consist, "in a person's legal right and uninterrupted enjoyment of his life, his limbs, his health, and his reputation."

In the earlier days of civilization many diseases were looked upon as providential visitations, and therefore non-preventable. In the Common Law of England, however, the principle that the government is bound to take every possible precaution against the spread of disease is well defined, not only indirectly by declaring for the preservation of life and health, but directly by providing penalties for persons offending against public health, or spreading such diseases as were then looked upon as contagious. The Common Law of England is operative in principle in most of the States of our Union; and its provision for life and health are affirmed in the Constitution of probably most of the States. Section 1 of the Constitution of Pennsylvania reads: "All men are born equally free and independent, and have certain inherent and inalienable rights, among which are those of enjoying and defending life and liberty, etc." The words defending life must be given a broader interpretation than mere defense against the anger of a fellow man. A reasonable interpretation makes it a defense against every danger to life for which the ingenuity of man has constructed a defense.

Modern science teaches us that many of the diseases, which were formerly looked upon as divine visitations, are but ordinary warfares between various forms of organic life for self-existence; and that when death ensues it is the going under of the weakest and the survival of the fittest. Man, the most perfect and the most intelligent of all of God's creatures, falls a victim to the onslaughts of organisms so minute that they can only be seen by the aid of most powerful lenses. What these little warriors lack in size they make up in number, and in their great power of reproduction and multiplication. The organism of man, so perfect in its construction, so complex in its machinery, and so complete in its equipment for defensive warfare against parasitic vegetation, ought never to prove the weakest in a contest with organisms so primitive in construction as are disease germs. But the tiniest and the simplest organism becomes a power when acting in concert with a large enough number of organisms of its own kind. There is a law in Nature that the smaller and more primitive an organism, the more rapid its reproduction, and in pursuance of this law, disease germs, when they once gain entrance into proper soil, multiply so rapidly that the mechanical obstruction of their presence in itself becomes a menace. It is in this their great numbers that they become great and prove themselves the victors in the contest for survival.

Ever since man has inhabited the earth he has

bethought himself of ways and means to escape and overcome disease. The accumulated thought and ingenuity of centuries has at last demonstrated to us how some diseases can at least be avoided. We now not only know that disease is mostly due to a living organism, but of some diseases we have learned enough about the organism that we can lay down pretty definite rules as to how to circumvent its development. We know what kind of soil it needs, how it is transplanted from person to person, or from persons to animals, and from animals to persons, what will readily destroy it outside of its host, how it is influenced by temperature and moisture, etc. We know, in fact, how we can prevent it from propagating any longer among us, and thus drive it entirely from our midst.

Of all diseases, the one concerning which we have this knowledge with the greatest accuracy, is tuberculosis. So dreadful has been the onslaught of this disease upon the human family that in all ages, from the days of Hippocrates down to the present, some of the brightest minds the world has produced have devoted themselves to the study of its cure and prevention. The question of its cure has not yet been satisfactorily solved, but that of its prevention has been made as clear as any problem in mathematics. We know positively that the propagation of the disease germ depends upon the contamination of the well by the sick. We know also that this contamination can only take place in a certain way, namely through the medium of broken-down tubercular tissue. We know further, that the disease germ can very readily be destroyed in this broken-down tissue before it is able to reach a new host, and that if this is done the propagation of the disease will be stopped. The question of the prevention of tuberculosis, therefore, resolves itself into a question of how the broken-down tubercular tissue given off by hundreds of thousands of persons and animals, laboring under the disease, can be destroyed before it has an opportunity of reaching and infecting others. The practical solution of this question can only be accomplished by the government.

In most of the European governments, in harmony with their political institutions, there are National Boards of Health with many dependent subordinate boards, to which is entrusted the care for the health of the people. Under our American form of government this system is not practicable, but we could have United States and State Boards of Health, which would act in harmony, and to each of which certain duties would naturally fall. There is no more reason why we should not have such Boards of Health, than there is, why we should not have United States and State Courts. We have State Boards of Health in most of the States, but we

have none in the United States. Not only should we have a Department of Health in the United States, but it should be made compulsory on every State to have such a department. The contract between the people and the government cannot and will not be carried out until the machinery for such departments has been constructed and put into operation.

The duties which would fall to a United States Department of Health in the prevention of tuberculosis, and which cannot be performed by a State Department, are the prevention of the importation of the disease from foreign countries and the carrying of it from State to State by commerce and travel. No immigrants should be allowed to enter our parts who are suffering from tuberculosis. Where such have been carried it should be seen that the ship which has carried them is properly disinfected, or at least that our own people be warned against travelling in that ship unless it is so disinfected. A thorough system of disinfection should be practiced under the supervision of the United States, on the coast vessels playing between north and south, all of which carry a large number of consumptives. All interstate railway travel should be kept under surveillance by the United States' Government, and railway companies should be compelled to provide a complete system of disinfection of all apartments occupied by persons suffering from tuberculosis. The transportation of tuberculous animals or tuberculous meat should be entirely prohibited.

In addition to these duties for the prevention of tuberculosis, which are incumbent upon the United States, because they cannot be performed by the States, there are others in which the Federal Government is co-sharer with the State Government. The Constitution of the United States gives Congress power to "lay and collect taxes, duties, impost, and excises, to pay debts and provide for the common defense, and general welfare of the United States;" . . . Under the power thus given the United States maintains an army and navy, and marine hospital service, army and navy hospitals, and educational institutions for the training of soldiers and sailors. Under the same power it could and ought to maintain a department of health, hospitals for the isolation and treatment of tuberculosis, and scientific institutions in which the disease could be studied and men given a practical training in methods of prevention. Our people have as much right to be protected against a disease which is known to be preventable as against a foreign foe.

To the State falls the lion's share of the duty in the prevention of tuberculosis. Every State in the Union should have a Department of Health, with subordinate Departments in every county of

the State. It ought to be the duty of this body to keep a record of every case of tuberculosis in the State, and of every movement of such case. Physicians ought, therefore, to be required to report every case of tuberculosis immediately upon discovery. When a case has been reported a competent officer of the State should at once be sent to the family to instruct them how to protect themselves against the disease. If they are too poor to supply themselves with the necessary means of self-protection, such means should be supplied to them, or they should be induced to remove the sick member to a special hospital for treatment. In order that sufficient opportunity be given for the tuberculous poor to be properly treated for the disease, the State ought to maintain well equipped special hospitals in various parts of the State of convenient access. Whenever a case of tuberculosis removes from a house, or dies, the State should at once, before the house can be occupied by another, thoroughly disinfect every part of it, scrape and replaster the room which was occupied by the patient, and take precautions that none of the clothing or furniture which had been used by the patient be given away or left for the use of others without first having been thoroughly disinfected. A house thus cleansed should be so recorded in the office of the department, so that any one wishing to move into it may be able to first assure himself that he runs no risk.¹ The State should also forbid and restrain the sale of food contaminated with the disease germ of tuberculosis. All slaughter houses and dairies should be inspected by competent men, and all tuberculous meat, and tuberculous milk-cows be condemned and redeemed by the State. No persons suffering from tuberculosis should be allowed to follow any avocation, in which he can contaminate the food, the implements or the wearing apparel of another. To obviate any hardships, every person suffering from tuberculosis, who is compelled to support a family, or who has anyone depending upon him, should for the time being become a pensioner of the State to the amount of his wages. Inasmuch as he gives up his earnings for the good of the public, it is but just and proper that he be supported as well as those depending upon him, at the expense of the public. I know that this will be cried down as expensive, and by some even as useless. That it would be expensive I admit; but I cannot help but feel that our present knowledge of tuberculosis will satisfy every one who will take the trouble to study the question, and whose mind is not preoccupied by a pet theory of his own, that such preventative measures would wipe out the disease.

As regards the expense, the Government, both Federal and State, is not only justified, but is

bound, by the very contract upon which it is based, to protect the people against preventable disease. All the purposes for which government is constituted may be briefly summed up under *life and its continuation for the allotted length of time without endangerment by violence or disease*. Every act of rational man is unconsciously tinted by a motive for unmolested existence. Our very physical construction is framed with this in view. Nature lets us suffer pain to indicate to us that life or limb is in danger. We have feelings of well being to show that all is right. All happiness, indeed, is dependent upon a feeling of security against danger to life for its existence. We seek to be at liberty, because we fear that restraint may prejudice our existence or that of those who are dear to us, or may place us in a position where at some time or at another we might not be able to protect ourselves or them. We seek to possess property in order that we can always supply the wants of Nature to ourselves and those dependent upon us, and that we and they can refrain from exertions when our bodies need rest. In short the pursuit of happiness may be tersely defined as the chase of the foes of life. The question of expense can, therefore, hardly be allowed to be brought forward as an argument against any preventive measures against tuberculosis. Whatever the expense might be, however, it would certainly be very small as compared to what would be saved to the people by an avoidance of the disease, even though the question of the preservation of life were left out. The return for the expenditure in the way of individual and public prosperity would amply compensate for the outlay.

It is estimated that one hundred thousand people die annually from tuberculosis in the United States.² It is well known that the largest number of victims are taken during the first half of ordinary life. Making a due allowance for the number who, being saved from tuberculosis, might fall a victim to accident or some non-preventable disease, it would, I think, be a fair estimate to assume that the average number of years of usefulness lost by each of these one hundred thousand people is ten years. We then lose every year by tuberculosis the earning capacity of one million people for one year, which, put down in dollars and cents, at the low estimate of an average earning capacity for each individual of three hundred dollars a year, would amount to three hundred million dollars. Tuberculosis is, moreover, usually a chronic disease, and of long duration. At a very low estimate, the average length of time for which a tuberculous patient is incapacitated for work before death, may be placed at six months, during which time the earning capacity of one other member of the

¹ For this thought I am indebted to my friend, J. V. P. Turner, Registrar of the Philadelphia Board of Health.

² Address on Phthisis Pulmonalis by Wm. M. Collum, M.D., Journal American Medical Association, vol. xvi, page 361.

family is at least crippled because of nursing and care required by the sick one. In this way the earning capacity of from fifty to a hundred thousand people more, for one year, is sacrificed and lost to public wealth. To the loss of time must be added the expenses incidental to sickness, which, if they averaged but fifty dollars for each sick person, would amount to five million dollars a year. It will be very apparent to every one that I have placed all my estimates too low; but even with these low estimates, the annual loss to the public wealth of the United States because of the existence of tuberculosis will reach close on to five hundred million dollars. The expenditure of one-fifth of that amount by the federal and State governments for the extermination of the disease, would completely wipe out the disease in a single generation.

I am fully aware that there are men in the medical profession, and prominent men, too, who still hold that tuberculosis is not a preventable disease, and who cry down any preventative measures on the part of the government as a useless waste of public money. If there is any doubt on the part of the government on this question, it is certainly its duty to appoint a commission to carefully examine into the question and clear up the doubt one way or another. Either tuberculosis is a preventable disease or it is not. If it is a preventable disease, the government is in duty bound to prevent it, just as much as it is bound to protect its citizens against war. The finger of science points to the fact that tuberculosis is a preventable disease. Can our government afford to wait until every skeptic in the land has been convinced that it is preventable? No; its duty begins in the very beginning, with the scientific research into the preventability of the disease, and does not end until its citizens can walk this noble land for three score and ten years, unmolested in health, life and limb by aught that can be brought under the domain and control of man.

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THE DISINFECTION OF EXCRETA.

Read in the Section on State Medicine at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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The Committee on Disinfectants appointed by the American Public Health Association in 1884, in its final report submitted in 1887, gives the following *general directions*:

Disinfection of Excreta, etc. The infectious character of the dejections of patients suffering from cholera and from typhoid fever is well established, and this is true of mild cases and of the earliest stages of these diseases as well as of

severe and fatal cases. It is probable that epidemic dysentery, tuberculosis, and perhaps diphtheria, yellow fever, scarlet fever, and typhus fever, may also be transmitted by means of the alvine discharges of the sick. It is, therefore, of the first importance that these should be disinfected. In cholera, diphtheria, yellow fever, and scarlet fever, all vomited material should also be looked upon as infectious. And in tuberculosis, diphtheria, scarlet fever, and infectious pneumonia, the sputa of the sick should be disinfected or destroyed by fire. It seems advisable also to treat the urine of patients sick with an infectious disease with one of the disinfecting solutions below recommended.

Chloride of lime, or bleaching powder, is perhaps entitled to the first place for disinfecting excreta, on account of the rapidity of its action. The following standard solution is recommended:

Dissolve chloride of lime of the best quality,¹ in pure water, in the proportion of six ounces to the gallon. Use one quart of this solution for the disinfection of each discharge in cholera, typhoid fever, etc.² Mix well and leave in the vessel for at least one hour before throwing into privy vault or water closet.

The same directions apply to the disinfection of vomited matters. Infected sputum should be discharged directly into a cup half full of the solution. A five per cent. solution of carbolic acid may be used instead of the chloride of lime solution, the time of exposure to the action of the disinfectant being four hours." (Op. cit., pp. 237, 238).

The object of this paper is to inquire whether these recommendations, which were based upon the experimental data available at the time they were made, are sustained by subsequent investigations; and whether any other agents have been shown to possess superior advantages for the purpose in view.

But first we desire to call attention to another portion of the report of the Committee on Disinfectants. On page 236 the following definition of disinfection and disinfectants is given:

"The object of disinfection is to prevent the extension of infectious diseases by destroying the specific infectious material which gives rise to them. This is accomplished by the use of disinfectants. There can be no partial disinfection of such material; either its infecting power is destroyed or it is not. In the latter case there is a failure to disinfect. *Nor can there be any disinfection in the absence of infectious material.*"

¹ Good chloride of lime should contain at least 25 per cent. of available chlorine (page 92). It may be purchased by the quantity at 3½ cents per pound. The cost of the standard solution recommended is therefore but little more than a cent a gallon. A clear solution may be obtained by filtration or by decantation, but the insoluble sediment does no harm and this is an unnecessary refinement.

² For a very copious discharge use a larger quantity.

I have italicised the last sentence because I wish to call especial attention to it. I am frequently asked "what is the best disinfectant to put into a water closet." Now if a closet or dry vault is resorted to only by healthy persons and no infectious material has been thrown into it there is nothing in it to disinfect, and the recommendation of the Committee on Disinfectants does not apply to it at all. It may smell badly, and in this case the bad odor may be neutralized by the use of deodorants; or we may prevent the putrefactive decomposition of its contents and thus prevent the formation of the offensive gases given off as a result of such decomposition, by the use of antiseptics. But to accomplish this it is not necessary to sterilize the entire contents by the use of active germicide agents.

A solution of sulphate of iron or of chloride of lime is an useful antiseptic and deodorizing agent, and the Committee on Disinfectants in making its recommendations did not intend to discourage the use of such agents. But exact experimental work has showed that these agents could not be depended upon for the destruction of infectious disease germs, and the recommendations made related to disinfection in the strict and proper use of the term as above defined. This definition is now accepted by sanitarians in all parts of the world, but many practicing physicians still use the term disinfectant as synonymous with deodorant. For example, I find in a recent sanitary periodical under the heading "Medical Excerpt," an item copied from the *American Journal of Obstetrics*, to which the name of a distinguished gynecologist is attached, in which the following statement is made with reference to a much-advertised so-called "disinfectant." "As a disinfectant I have used it in my house for over a year with great satisfaction." Now the agent referred to has been proved by exact experiments to have comparatively little disinfecting power, although it is a very good deodorant. According to our definition "the object of disinfection is to prevent the extension of infectious diseases by destroying the specific infectious material which gives rise to them." Are we to suppose that the distinguished gynecologist above quoted had such infectious material in his house "for over a year" at the time he was employing "with great satisfaction" the agent he recommends? If not, the term was improperly employed for "there can be no disinfection in the absence of infectious material." I wish to emphasize this point because I have reason to believe that, in the army at least, the recommendation of the Committee on Disinfectants has led to the substitution of chloride of lime for cheaper deodorants and antiseptic agents and especially for sulphate of iron—in latrines which are frequented only by healthy persons and consequently need no disinfection. The amount of chloride of lime issued from the Medi-

cal Purveying Depot at San Francisco during the past six months for use at military posts on the Pacific Coast, is more than double the amount of sulphate of iron; but there has been no epidemic of an infectious disease, and probably comparatively little call for the use of a disinfecting agent in the sick room. We quote again from the report of the Committee on Disinfectants:

"In the sick-room we have disease germs at an advantage, for we know where to find them as well as how to kill them. Having this knowledge, not to apply it would be criminal negligence, for our efforts to restrict the extension of infectious diseases must depend largely upon the proper use of disinfectants in the sick-room." (Op. cit., p. 237).

"The injurious consequences which are likely to result from such misapprehension and misuse of the word disinfectant will be appreciated when it is known that recent researches have demonstrated that many of the agents which have been found useful as deodorizers or as antiseptics, are entirely without value for the destruction of disease germs.

"This is true, for example, as regards the sulphate of iron or copperas, a salt which has been extensively used with the idea that it is a valuable disinfectant. As a matter of fact, sulphate of iron in saturated solution does not destroy the vitality of disease germs, or the infecting power of material containing them. This salt is, nevertheless, a very valuable antiseptic, and its low price makes it one of the most available agents for the arrest of putrefactive decomposition." (Op. cit., p. 237).

Chloride of lime is also a valuable antiseptic and deodorant, and I know of no objection to substituting it for sulphate of iron other than the question of cost. The first cost of chloride of lime, by the quantity, is about double that of sulphate of iron, but practically the difference is much greater because it is necessary to preserve the chloride of lime in air-tight packages. When exposed to the air it deteriorates in value very rapidly. It is therefore necessary to pack it in air-tight receptacles, which will not be injured by the corrosive action of free chlorine, and in comparatively small quantities, so that the contents of a package may be used soon after it is opened.

We now proceed to consider the experimental data relating to the germicide value of *chloride of lime*.

The Committee on Disinfectants gave it "the first place for disinfecting excreta on account of the rapidity of its action." This recommendation was upon experimental data obtained in the pathological laboratory of the Johns Hopkins University, under the writer's direction, and is sustained by more recent experiments made in Germany.

The experiments of Bolton, made for the Com-

mittee on Disinfectants in 1886, gave the following results: The time of exposure being two hours the typhoid bacillus and cholera spirillum in bouillon cultures were killed by a solution containing one part to 1000 parts of water (containing 0.03 per cent. of available chlorine). Anthrax spores were killed in the same time by a solution, containing 0.3 per cent. of available chlorine. Typhoid fæces were sterilized by a two per cent. solution, and in several instances by a one-half per cent. solution, but some resistant spores of non-pathogenic bacilli survived in two experiments in which a solution of 1:100 was used. In bouillon cultures to which 10 per cent. of dried egg albumen had been added, the typhoid bacillus was destroyed one-half per cent. (1:200).

Nissen, whose experiments were made in Koch's laboratory in 1890, found that anthrax spores were destroyed in thirty minutes by a 5 per cent. solution, and in 70 minutes by a 1 per cent. solution. In his experiments the typhoid bacillus and the cholera spirillum were destroyed with certainty in five minutes by a solution containing 0.12 per cent. (1:833); the anthrax bacillus in one minute by 1:1000; staphylococcus pyogenes aureus in one minute by 1:500. Experiments made by the same author on the sterilization of fæces showed that 1 per cent. could be relied upon to destroy the bacillus of typhoid fever and the spirillum of cholera in fæces in ten minutes.

Carbolic Acid.—The Committee on Disinfectants says: "A five per cent. solution of carbolic acid may be used instead of the chloride of lime solution, the time of exposure to the action of the disinfectant being four hours." This recommendation is made in view of the fact that in those diseases in which it is most important to disinfect the excreta, the specific germ does not form spores. This is now believed to be true of the typhoid bacillus, the spirillum of cholera, the bacillus of diphtheria, the bacillus of glanders, and the streptococcus of erysipelas; and it has been shown by exact experiments that all of these pathogenic bacteria are destroyed in two hours by a one per cent. solution, or less, of this agent.

Spores require for their destruction a stronger solution and a longer time. Koch found a one per cent. solution to be without effect on anthrax spores after fifteen days exposure; a two per cent. solution retarded their development, but did not destroy their vitality in seven days; a three per cent. solution was effective in two days. According to Nocht, at a temperature of 37.50 C., anthrax spores are killed by a five per cent solution in three hours.

Carbolic acid possesses the advantage of not being neutralized by the substances found in excreta, or by the presence of albumen. Thus Bolton found that the addition of 10 per cent. of dried albumen to a bouillon culture of the typhoid bacillus did not materially influence the result, the

bacillus being destroyed in two hours by a one per cent. solution.

This agent, then, is firmly established as a valuable disinfectant for excreta, but we still give the preference to the standard solution of chloride of lime of the Committee on Disinfectants for use in the sick room, "on account of the rapidity of its action," and also on account of its comparative cheapness.

At the International Sanitary Conference, Rome (1885) the writer, who was associated with Dr. Koch on the Committee on Disinfectants, presented the claims of chloride of lime, and the recommendations of the committee it was placed beside carbolic acid with the following direction:

"Carbolic acid and chloride of lime are to be used in aqueous solution.

"Weak solutions, carbolic acid 2 per cent.; chloride of lime 1 per cent.

"Strong solutions, carbolic acid, 5 per cent. chloride of lime, 4 per cent."

The strong solutions were to be used for the disinfection of excreta.

Creolin, a coal tar product, which is a syrupy dark brown fluid with the odor of tar, has during the past three years received much attention from the German bacteriologists. It is probably the same product which was tested under the writer's direction for the Committee on Disinfectants, 1885, under the name of "Little's soluble phenyle." It stood at the head of the "Commercial Disinfectants" tested. The experiments made in Germany show that it is not so active for spores as carbolic acid, but that it very promptly kills known pathogenic bacteria, in the absence of spores, in solutions of 2 per cent. or less. Eichenberg found that a solution of two per cent. killed all test organisms within 15 minutes. Eismarch found it especially fatal to the cholera spirillum, which was killed by solutions of 1:100 in ten minutes. The typhoid bacillus showed much greater resisting power—a one-half per cent. solution failed after ten minutes exposure. The pus cocci were still more resistant. Behring has shown that the presence of albumen greatly diminishes its germicide power. As a deodorant it is superior to carbolic acid, and on this account is to be preferred in the sick room. A recently prepared emulsion may be used to disinfect the liquid excreta of cholera or typhoid patients, in the proportion of four per cent., two hours time being allowed for the action of the disinfectant. The experiments of Jaeger upon pure cultures of the tubercle bacillus attached to silk threads were successful in destroying the infecting power of these cultures, as tested by inoculation into the anterior chamber of the eye of a rabbit, when solutions of 2 per cent. were used.

The value of this agent as a disinfectant is then fully established; as to its cost in comparison

on with the agents heretofore mentioned I am not informed.

Quick Lime.—Experiments made in Koch's laboratory in 1887 by Liboriws led him to place high value upon recently burned quick lime as disinfectant. More recent experiments by Eger, Kitisato, Pfuhl, and others have shown that this agent has considerable germicide power, the absence of spores, and that the value which has long been placed upon it for the treatment of crementitious material in latrines, etc., and as wash for exposed surfaces, is justified by the results of exact experiments made upon known pathogenic bacteria. The germicide power of lime is not interfered with by the presence of aluminous material, but is neutralized by phosphates, carbonates and other bases, and by carbonic acid.

In the writer's experiments a saturated aqueous solution of calcium oxide failed to kill typhoid bacilli; but when suspended in water in the proportion of 1:40 by weight this bacillus was killed at the end of two hours. Anthrax spores were not killed in the same time by a lime wash containing 20 per cent. by weight of pure calcium oxide. According to Kitisato the typhoid bacillus and the cholera spirillum in bouillon cultures are destroyed by the addition of 0.1 per cent. of calcium oxide. Pfuhl experimented upon sterilized fæces to which pure cultures of typhoid bacillus, or cholera spirillum were added. The liquid discharges of patients with typhoid fever or diarrhoea were used for the purpose. He found that sterilization was effected at the end of two hours by adding fragments of calcium hydrate in the proportion of 6 per cent., and that 3 per cent. was effective in six hours. When a milk of lime was used which could be thoroughly mixed with the dejecta the result was all more favorable. A standard preparation of milk of lime containing 20 per cent. of calcium hydrate killed the typhoid bacillus and the cholera spirillum in one hour when added to liquid fæces in the proportion of 2 per cent.

The experiments with this agent show that lime is an important factor and that much longer exposures, as well as stronger solutions, are required to destroy pathogenic bacteria, than is the case with chloride of lime. For this reason we still give the last named agent the preference for the disinfection of excreta in the sick room. In latrines the time required to accomplish disinfection is of less importance; and we are disposed to give recently burned quick lime the first place for the disinfection of excreta in privy vaults, on the surface of the ground. It may be applied in the form of milk of lime, prepared by adding gradually eight parts, by weight, of water to one part of calcium hydrate. This must be freshly prepared, or protected from the air to prevent the formation of the inactive carbonate of lime.

According to Behring lime has about the same germicide value as the other caustic alkalies, and destroys the cholera spirillum and the bacillus of typhoid fever, of diphtheria, and of glanders, after several hours exposure, in the proportion of 50 cc. *normal-bauge* per litre. Wood ashes of lye of the same alkaline strength may therefore be substituted for quick lime.

Finally, it must not be forgotten that we have a ready means of disinfecting excreta in the sick-room, or its vicinity, by the application of heat. Exact experiments made by the writer and others show that the thermal death-point of the following pathogenic bacteria, and of the kinds of virus mentioned is below 60° C. (140° F.): Spirillum of cholera, bacillus of anthrax, bacillus of typhoid fever, bacillus of diphtheria, bacillus of glanders, diplococcus of pneumonia (M. Pasteuri), streptococcus of erysipelas, staphylococci of pus, micrococcus of gonorrhoea, vaccine virus, sheep pox virus, hydrophobia virus. Ten minutes exposure to the temperature mentioned may be relied upon for the disinfection of material containing any of these pathogenic organisms—except the anthrax bacillus when in the stage of spore formation. The use, therefore, of *boiling water in the proportion of three or four parts to one part of the material to be disinfected* may be safely recommended for such material. Or better still, a 10 per cent. solution of sulphate of iron or of chloride of zinc, at the boiling point, may be used in the same way (three parts to one). This will have a higher boiling point than water, and will serve at the same time as a deodorant. During an epidemic of cholera or typhoid fever such a solution might be kept boiling in a proper receptacle in the vicinity of the hospital wards containing patients, and would serve to conveniently, promptly, and cheaply disinfect all excreta.

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THE SANITARY AND UNSANITARY RELATIONS OF UNDERGROUND WATERS.

Read in the Section of State Medicine, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY S. H. BRYCE, M.D.,
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Gentlemen:—It is not my intention to deal at any length with this subject, but rather to present some of the principles to be observed in the selection of drinking-waters.

Much has been said with regard to the dangers of drinking water from wells; but it has not been until recently that the differentiation has been made as regards wells that are dangerous and those that are healthy.

As a general principle, it may be said that practically all *really* underground waters are sanitarily good; but it must be clearly understood what is meant by an underground water. For instance:

1. A water lying in a shallow dug out in prairie or bog land, down only to the impervious clay or rock below, cannot fairly be called underground water.

2. Neither can a well down even into a true water-bearing stratum of sand or gravel, be called an underground water, if the water of the upper organic soil layer is allowed to percolate toward the well laterally, without really moving downward through the underlying beds of clay loam, sand or gravel, which serve to sterilize the waters in their passage downward.

3. Neither can a well be called underground if, as is commonly the case, the well is covered with loose boards, or a wooden framework, thereby allowing the filth washings from the surface of the boards to be carried down through cracks into the water of the well.

Carl Fraenkel and others have carefully examined into the water of pit-wells, and such have by Pflügge been called "hygienic monsters."

Clearly, then, underground waters mean those which have primarily fallen upon the surface, have there been contaminated with soil microbes, but which have, in their passage downward, through percolation to the water-bearing zone situated on some impervious stratum, been purified by the several natural agencies which are at work.

Of these, doubtless, the one of greatest importance is the mechanical retention in the upper layers, of the grosser organic matters, for instance those of sewage on a sewage farm.

I have found that at a sewage farm, the upper circle or two of the bed of sand has retained practically all suspended organic matters, and the even soluble organic matters are gradually abstracted by capillary adhesion from waters as they pass downward.

In addition, however, to this cleansing action of capillarity, we have at work, under favorable conditions, the destructive action of bacteria. With various kinds of organic matters, putrefaction bacteria deal largely, but their work, while purifying to the soil, may result in emanations of an extremely injurious character. In order that this decomposition may go on rapidly and without pernicious results, intermittency of deposit of organic matter on the surface and the penetration of air with its oxygen into the soil is required, in order that the nitrifying germ, properly, may carry on its beneficent work.

Manifestly, therefore, we have in towns conditions where, with the permanent presence of masses of organic matter in back-yards and privies, waters may move laterally or from the surface, carrying to the largest extent their susceptibility admits of, organic materials to underground strata, which, appearing in wells, and there coming into contact with oxygen, supply conditions for the free multiplication of germs borne in from the surface or the air, and hence waters that have been sterile as underground streams, and loaded with soluble organic matters, become culture media for certain pathogenic bacteria in those seasons of the year when the water temperature makes their development abundant. Every one is familiar with wells dangerous only in the late summer months when deep, or from springing in early summer, when their water reaches a higher temperature.

Much interest has for many years attached to the experiments of Pettenkofer with regard to the rising and falling of underground waters and their bearing upon the increase in the mortality from filth diseases, notably of typhoid fever. It has been assumed that he was correct in saying that after a summer lowering of the ground water and then a rise with autumn rains, typhoid mortality increased.

Now, with regard to this, as with so many other conditions, individual local circumstances will decide whether or not he is correct. For instance, Buck and Franklin have laid special stress upon the wetness of soil in general, and the effect of highness or lowness of the subsoil water, as increasing the mortality of *cholera infantum*. Hirsch, on the other hand, has examined the relationship between the number of cases of cholera infantum and the level of the subsoil water at Berlin, from 1877 to 1882, and concluded that the height of the subsoil water at Berlin gives no measure of the rate of mortality. Now if we look closely into the facts there, the conclusions are as we would expect. The city

largely supplied with public water from the river sources, and naturally we find that during periods of high ground water, the rivers become increased in their volume, and instead of the drinking-water being more impure at such times, it would be less so.

But the case is different where well water is used. During the periods of dry weather, as the water in the superficial soil layers has gradually passed downward, it has been followed, according to the permeability of a soil, by atmospheric air, thereby extending the line of organic decomposition downward—this, however, being limited usually by the upper 4 or 5 feet.

What then takes place when heavy rains come? The first result is that the upper permeable bed, loaded with bacteria from free decomposition of organic matters, becomes saturated with moisture, while privies also, which have during the dry weather lost most of their fluid contents by evaporation, likewise become surcharged with moisture. The water from both these supersaturated sources moves along laterally downward toward the wells, as the lowest point, and loads them with soluble organic impurities, and with putrefactive and nitrifying bacteria; in addition to suspended impurities washed in from the surface. This causes disease, beyond question; but this is not due to the rise of ground water necessarily, since, as all know, the actual rise, in other than shallow subterranean water-streams and in springs, does not take place till weeks, or even months, after the spring or autumnal heavy rainfalls.

We, therefore, can see that the conditions governing the purity of water supplies from ponded streams and small lakes, are very different from those governing well waters, as in pit-wells. When the first are most foul, the latter are often least so.

The question, then, of the use of underground waters, is of a much wider nature than that relating merely to pit-wells in town and country.

Falling upon pervious upper soil and upland and cultivated fields, the rain forms those great reservoirs upon which river and lake supplies, as also that of ordinary wells, depends. Springs on the hillside are the index of their existence, and to these streams must we look for a pure water supply, obtained under conditions widely different from those we have just referred to.

Analyze these spring waters before contaminated by surface filth, drive an iron pipe down to this water-bearing stratum, and we find a water in all cases absolutely free from bacterial life, and under those conditions which make pit-wells under ordinary conditions, such dangerous sources of supply.

As the rivers, in recent years, have been falling during the long summer, through the loss of the upland forests which formerly held back the water, and whose absence likewise creates long summer droughts, relieved at most by destructive

thunder-storms, we have found ourselves depending upon ponded waters, becoming more impure by evaporation, lessening their amount, or upon rivers becoming more polluted by this lessened amount, together with increasing pollution by our growing towns. We are hence forced to turn our attention to these underground waters, sometimes, it is true, somewhat excessive in hardness, but always sterile, and supplying to artesian wells, driven wells, water-galleries of perforated pipes, and springs carefully collected and protected against surface pollution, while the utilization of such will do much to solve the questions both of water supply and sewage which, upon this rapidly populating continent, are to-day of more importance than probably all other health problems combined.

SECTION OF OPHTHALMOLOGY.

RECORD OF THE MEETINGS.

DR. LEARTUS CONNOR, Chairman.

DR. T. E. MURRELL, Secretary.

The sessions of this Section were held in the afternoon of May 5th, 6th and 7th, in the Medical Department of Georgetown University.

The chairman opened the first meeting with an address which contained very valuable suggestions in regard to promoting the interests of the Section. After the reading of this paper, upon motion, a committee of three was appointed to consider the suggestions in the Chairman's Address; the Chairman to be one of the committee.

The committee, consisting of Drs. Geo. E. Frothingham, Edward Jackson and Leartus Connor, reported on the second day as follows:

Gentlemen of the Ophthalmological Section, American Medical Association:

Your Committee, to whom was referred the Chairman's Address, begs leave to report upon his suggestions, by recommending the Section to adopt the following:

First, That the Section appoint an Executive Committee of three, whose general duties shall be to look after all matters pertaining to the development of the Section, not already in the hands of existing officers. When first appointed the members of this Committee shall serve for three, two and one years respectively, the yearly vacancy occurring thereafter shall be filled by the retiring chairman of the Section. Should other Sections appoint similar committees, it shall coöperate with them in all efforts to promote the interests of all Sections. It shall hold a yearly meeting, previous to the beginning of the sessions of the Section, at an exact date and place to be named by the Chairman of the Committee, and at such other times and places as the Committee may deem best for the promotion of the growth of the Section.

Second, That the Executive Committee be instructed to formulate and execute the plans needful for securing the re-publication from THE JOURNAL of the work of the Section, including papers with the discussions thereon, a complete list of all members of the Association who are active workers in ophthalmology, and such other facts as may be necessary for the completeness of the publica-

tion, as the names and addresses of the officers, names and addresses of the Executive Committee, a copy of this report, etc. It shall carefully edit the papers, discussions, list of members, etc., so that they may appear in correct form, when given to the public as the work of this Section. It shall finally secure such mechanical execution of the work as will render its appearance creditable to the Section.

Third, That the Executive Committee shall arrange for a Section dinner on the evening of the second day of the Annual meeting, at the usual dining hour of the place of meeting, at a price not to exceed two dollars, each member paying for his own ticket.

Fourth, It shall secure the names and addresses of all reputable ophthalmologists in North America, and use all reasonable measures to secure their coöperation in the work of the Section.

Signed, GEORGE E. FROTHINGHAM,
 EDWARD JACKSON,
 LEARTUS CONNER,
 Committee.

On motion, this report was adopted unanimously, and the Chairman instructed to appoint the Committee. He named, in obedience to these instructions, the following as its members.

For three years, S. C. Ayres, 64 W. 7th St., Cincinnati, Ohio.

For two years, F. C. Hotz, 103 State St., Chicago, Ill.

For one year, Edward Jackson, 215 S. 17th St., Philadelphia, Pa.

S. C. Ayers being first appointed, was made Chairman of the Executive Committee.

On the afternoon of the second day, as fixed by the By-Laws, the Committee on nominations, consisting of Drs. F. C. Hotz, S. C. Ayers and J. J. Chisolm, reported the following officers for the ensuing year: Dr. J. L. Thompson of Indianapolis, Chairman; Dr. Geo. de Schweinitz of Philadelphia, Secretary.

Dr. S. C. Savage introduced the following resolution which was adopted.

Resolved, That the Section on Ophthalmology adopt the nomenclature introduced and applied to muscular insufficiencies by Dr. George T. Stevens.

Dr. Edward Jackson introduced the following resolution concerning the numbering of prisms, which was jointly agreed upon by himself, Dr. Swan M. Burnett and Dr. Alex Randall:

Resolved, That the Section on Ophthalmology of the American Medical Association, adopt and recommend as a standard or unit prism one which gives a deflection of one centimetre at the distance of one metre, and that this measurement may be taken on a plane up to No. 20. For higher numbers it is suggested that they be taken on the arc, or expressed in equivalent tangents. It also recommends to opticians and the profession for measurement the prismometer of Mr. C. F. Prentice.

The resolution was adoption by the Section.

Dr. Alex Randall exhibited the prismometer of Mr. Prentice.

Dr. S. C. Ayers exhibited a book he arranged for ophthalmologists entitled, "Oculist's Index Rerum." It is so arranged as to furnish a complete and handy index to every case in the case book according to classification. It will index

twenty thousand cases, and is so simple and clear in arrangement as to be invaluable to any one who writes for publication the interesting cases in his practice, or compiles statistics. The book is published by J. H. Chambers & Co., of St. Louis.

At the conclusion of the programme the Chairman returned thanks to the members of the Section for their courteous bearing, and in turn, upon motion of Dr. Swan M. Burnett, a vote of thanks was tendered the Chairman and Secretary.

T. E. MURRELL, Secretary.

MEMBERS OF AMERICAN MEDICAL ASSOCIATION INTERESTED IN OPHTHALMOLOGY.

ARRANGED ALPHABETICALLY BY STATES.

Those marked by a * were present at the meeting.

Sanders, W. H., Mobile, Ala.
* Murrell, Thomas E., 111 E. 5th St., Little Rock, Ark.
* Moulton, H., Fort Smith, Ark.
Miller, R. W., Los Angeles, Cal.
Chase, John, 3 Barth Block, Denver, Col.
* Burnett, S. M., 1770 Mass. Ave., Washington, D. C.
Marmion, Wm. V., 1108 F. N. W., Washington, D. C.
* Richey, Stephen O., 732 17th, N. W., Washington, D. C.
Cotter, Robert O., Macon, Ga.
Bettmann, Boerne, 18 Central Music Hall, Chicago, Ill.
Colburn, J. Elliott, 126 State St., Chicago, Ill.
Dickinson, Fannie, 70 State St., Chicago, Ill.
Fiske, George F., Opera House Bldg, Chicago, Ill.
Gardiner, E. J., 126 State St., Chicago, Ill.
Gradle, Henry, Central Music Hall, Chicago, Ill.
Harper, John E., 163 State St., Chicago, Ill.
Holmes, Edward L., 112 Clark St., Chicago, Ill.
* Hotz, Ferdinand C., 103 State St., Chicago, Ill.
* Jones, Samuel J., 7 Jackson St., Chicago, Ill.
* Montgomery, Wm. T., Opera House Bldg, Chicago, Ill.
Prince, Arthur E., Jacksonville, Ill.
* Starkey, H. M., 70 State St., Chicago, Ill.
Tilley, Robert, 125 State St., Chicago, Ill.
Ware, Lyman, 125 State St., Chicago, Ill.
* Wescott, Cassius D., 567 W. Madison St., Chicago, Ill.
Blitz, Adolph, 22½ W. Washington St., Indianapolis Ind.
Heath, F. C., Lafayette, Ind.
* Thompson, James L., 20 W. Ohio St., Indianapolis, Ind.
Dunlavy, J. C., Sioux City, Ia.
Hobby, C. M., Iowa City, Ia.
Young, H. B., Burlington, Ia.
* Minney, John E., Topeka, Kan.
Cheatham, Wm., 303 W. Chestnut St., Louisville, Ky.
Coomes, Martin F., 423 W. Chestnut St., Louisville, Ky.
Ray, J. Morrison, 419 W. Chestnut St., Louisville, Ky.
* Reynolds, Dudley S., cor. 3d and Chestnut Sts., Louisville, Ky.
Kennedy, Stirling D., 158 Canal St., New Orleans, La.
Hunt, David, 149 Boylston St., Boston, Mass.
Standish, Myles, 200 Dartmouth St., Boston, Mass.
Vermeyne, J. J. B., 2 Orchard St., New Bedford, Mass.
Carrow, Fleming, Ann Arbor, Mich.
* Connor, Leartus, 103 Cass St., Detroit, Mich.
* Frothingham, George E., 702 Woodward Ave., Detroit Mich.
Lundy, Charles J., 27 E. Adams Ave, Detroit, Mich.
Maire, Lewis E., 48 W. Adams Ave., Detroit, Mich.
Noyes, Jas. F., 16 Campau Bldg, Detroit, Mich.
* Smith, Eugene, 138 Lafayette Ave., Detroit, Mich.
Fulton, John F., 326 Wabasha St., St. Paul, Minn.
William, Cornelius, St. Paul, Minn.
Dickinson, Wm., 1322 Olive St., St. Louis, Mo.
* Pollack, S., St. Louis, Mo.
* Thompson, John H., 9th and Main Sts., Kansas City Mo.

Tiffany, Flavel B., 13th and Grand Sts., Kansas City, Mo.
 Tyree, Wm. C., 908 Wyandotte St., Kansas City, Mo.
 *Chisolm, Julian J., 114 W. Franklin St., Baltimore, Md.
 *Friedenwald, A., 310 N. Eutaw St. Baltimore, Md.
 *Randolph, Robert E., 211 W. Madison St., Baltimore, Md.
 *Bryant, D. C., Omaha, Neb.
 Denise, Jacob C., Omaha, Neb.
 Hepburne, Neil J., 399 W. 23d St., N. Y.
 Mittendorf, Wm. F., 104 Madison Ave., New York, N. Y.
 Noyes, Henry D., 233 Madison Ave., New York, N. Y.
 *Stevens, Geo. T., 33 W. 33d St., New York, N. Y.
 Allen, Harlan P., 73 State St., E. Columbus, Ohio.
 *Ayres, Stephen C., 64 W. 7th St., Cincinnati, Ohio.
 Baker, Albert R., 143 Euclid Ave., Cleveland, Ohio.
 *Dowling, Francis, Cincinnati, O.
 Buckner, Jas. H., 65 E. 4th St., Cincinnati, Ohio.
 Holmes, C. R., 84 W. 7th St., Cincinnati, Ohio.
 Larimore, F. C., Mt. Vernon, Ohio.
 Sattler, Robert, 64 W. 7th St., Cincinnati, Ohio.
 *Scott, Xenophon C., 127 Euclid Ave., Cleveland, Ohio.
 *Smith, Daniel B., 20 Euclid Ave., Cleveland, Ohio.
 Wright, John Wesley, 133 E. Spring St., Columbus, O.
 *de Schweinitz, George E., 1401 Locust St., Philadelphia, Pa.
 *Fenton, Thos. H., 1335 Arch St., Philadelphia, Pa.
 Goodman, H. Earnest, 1509 Walnut St., Philadelphia, Pa.
 *Gould, Geo. M., Philadelphia, Pa.
 Heustis, Jas. W., 426 Pennsylvania Ave., Pittsburgh, Pa.
 *Jackson, Edward, 215 S. 17th St., Philadelphia, Pa.
 *Keyser, Peter D., 1832 Arch St., Philadelphia, Pa.
 *Lautenbach, Louis J., 600 N. 6th St., Philadelphia, Pa.
 Lippincott, J. A., 435 Pennsylvania Ave., Pittsburgh, Pa.
 Morton, Thomas G., 1421 Chestnut St., Philadelphia, Pa.
 Oliver, Chas. A., 1507 Locust St., Philadelphia, Pa.
 Perkins, Francis M., 1428 Pine St., Philadelphia, Pa.
 *Randall, B. Alexander, 1806 Chestnut St., Philadelphia, Pa.
 Roberts, John B., 1627 Walnut St., Philadelphia, Pa.
 Steinbach, Lewis W., 716 Franklin St., Philadelphia, Pa.
 Strawbridge, G., 1500 Walnut St., Philadelphia, Pa.
 Taylor, Lewis H., 41 S. Franklin St., Wilkesbarre, Pa.
 Turnbull, Chas. S., 1719 Chestnut St., Philadelphia, Pa.
 Kollock, Chas. W., Charleston, S. C.
 Herron, John T., Jackson, Tenn.
 *Price, Geo. H., 519½ Church St., Nashville, Tenn.
 *Savage, Giles C., 619½ Church St., Nashville, Tenn.
 Sinclair, John G., Nashville, Tenn.
 *Sinclair, Alexander G., 13 Masonic Temple, Memphis, Tenn.
 Smith, Frank T., Chattanooga, Tenn.
 Chilton, Robert H., Dallas, Texas.
 Tyner, T. J., Austin, Texas.
 White, Jos. A., 410 E. Grace St., Richmond, Va.
 Thomson, R. L., Howard St., Spokane Falls, Wash.
 Wuerdemann, H. V., Grand Ave., Milwaukee, Wis.

OTHER METHODS OF PROMOTING THE DEVELOPMENT OF THE SECTIONS.

Suggestions to the Section on Ophthalmology of the American Medical Association, at its meeting in Washington, D. C., May, 1891, by the Chairman,

LEARTUS CONNOR., A.M., M.D.,
 OF DETROIT, MICH.

The future of the American Medical Association rests upon the works of its Sections. If this stands the test of criticism by intelligent medical men, then will the Association attract to its membership an increasingly large number of representative physicians from every portion of the American Continent.

The history of this Section is well known. From a membership of a dozen it has increased to over one hundred. From material insufficient for a few hours it has grown to a stage when its wealth of material taxes every energy for its profitable disposition during the longest obtainable sessions. Its career has been checkered by numerous disturbing and destructive forces, but having continued to develop in spite of these, and by their aid, it may confidently anticipate a future more useful to our science, more helpful to ourselves and more honorable to the profession. During the time allowed for remarks by your chairman, it were impossible to give an exhaustive account of the ophthalmological work accomplished during the past year. In general, we may say that no "epoch making discovery" has appeared, though every department exhibits important contributions. Some of these clear away obstructions, others add new facts, new principles and new processes. The true has been more firmly established, the doubtful rendered possible or certain, and some steps taken into the unknown.

The thirty-four papers presented at this meeting will unquestionably still further enrich our literature and render future work more satisfactory. I refrain from the discussion of any related topic in order that more time may be reserved for the reading and discussion of these papers. I am the more disposed to this course because I regard the position of chairman of this Section, as one calling for an undivided service to the interests of the entire Section. He is simply the servant of the Section. In this service I have learned numerous facts, from which I present certain suggestions:

First.—By rule of the Association, our papers and discussions are published in *THE JOURNAL*. This gives them a wide circulation among the profession and a permanent place in the volumes of *THE JOURNAL*. Some papers are reprinted at the expense of their authors and distributed among their ophthalmological friends. Thus, with a large and increasing circulation of *THE JOURNAL*, our contributions are disposed of in a profitable manner. But it has occurred to me that other useful purposes might be accomplished by an extension of their publication. To illustrate: The American Laryngological Society first publishes its papers and discussions in the *New York Medical Journal*. This being completed, they are republished in a separate form, as the transactions of this society. With these is printed a list of the members of the society, its rules and other important items of information. In like manner it is suggested that this Section arrange to have its papers and the discussions thereon, republished from *THE JOURNAL*, and with them printed an accurate list of all the members of the Association interested in

ophthalmology, and such other facts as would promote the interests of the Section. Such a republication would be a great convenience to us individually, and to all our fellow workers throughout the world. Life is short, its duties exacting and multiform, so that to be most valuable, work must be presented to busy men in a form readily accessible, else it will fail of the immediate accomplishment of its mission. The expense of this republication need not be great, and it is thought would be cheerfully met by such members as are interested in the development of the Section. The volumes also would have a limited sale that would partially meet the publication expenses. It seems clear that such an arrangement would attract other valuable workers into our ranks, and so augment the strength of the Section. In such a republication our work would stand out boldly as a unit, for the criticism of our colleagues. Individuals knowing that their papers were thus to receive added attention from experts, would be still more careful to prove their work several times ere bringing it before such a tribunal. Those having done work which they were confident would stand this added test, would gladly embrace the opportunity, and so our Section work would rise to progressively higher planes.

Were the Section to successfully inaugurate this change, others would follow, until each Section of the Association had its distinctive volume of transactions. Such a result must bring increased prosperity to both Association and Journal. The world at large estimates the Association, mainly, by what it sees of its Section work. THE JOURNAL stands or falls by the quality of the material sent it by the Sections. Hence of necessity, the backbone of both Association and Journal is constructed of the several Sections. THE JOURNAL has wonderfully aided the Sections and the proposed change must favorably increase this aid.

Second.—There should be made, subject to yearly revision, a list of all members of this Section. It should include all workers in this field who are members of the Association. Such a list would enable the members to know their fellow workers, and to exert such an influence as would secure from each his best work for this Section's meetings. Instead of being lost in a list of several thousand members, our fellows would have a distinctive individuality of their own. As already suggested, this list could be issued with the proposed volume of yearly transactions, and be compiled by the same publication committee. Such a list I have compiled, as completely as was possible, and present it to the Section for the use of the officers and the convenience of the fellows. All reputable physicians interested in ophthalmology can, by joining the American Medical Association, become members

of this Section. If only the proper measures be adopted, it is possible that most reputable ophthalmologists in the United States will find membership in this body both profitable and pleasant to them.

Third.—Granting that the value of the Association meetings depends mainly upon the work of the Sections, it follows that the time given for Section work should be fully adequate for doing it in a perfectly satisfactory manner. There may be difference of opinion on this point, but it does not seem that less than six hours daily, will meet the present needs of this Section. When it becomes known that such a space of time is devoted to the reading and discussion of ophthalmological questions, these meetings will possess greater attraction to earnest students. They will see in attendance upon them adequate compensation for the fatigue of long journeys, the loss of private business and the corresponding diminution of income, the expenditure of considerable sums of money called for by such journeys and protracted absence from home. To secure larger attendance it must be shown that these meetings are worth more than the cost of time, of labor or of discomfort. The increase of the hours devoted to actual work as suggested would, I am certain, so increase the profit of these meetings as to outweigh the necessary cost, to a far larger number than at present. I am aware that the time devoted to the Section meetings is regulated by the Association, but it is certain that the agitation of the matter by earnest members of the Sections would meet a sympathetic response, and the problem be solved to the satisfaction of all.

Many thoughtful observers unite in the conviction that all interests would be best advanced by a very considerable shortening of the general sessions of the Association. They believe that most of the business and discussions of these sessions were better done by committees, and the time thus saved be given to the Sections. With six full working hours daily, free from all disturbing influences, the Sections would quite astonish both themselves and the Association, with the results they would attain—results helpful and uplifting to all members of the Sections, to the Association as a whole, to its Journal and to the profession at large.

Fourth.—Social commingling has its proper place. Each of us has felt the enlargement due to the personal contact with a fellow worker formerly known to us only by reputation. To have grasped his hand, to have looked into his face, to have listened to his voice, and to have been infected with his enthusiasm, has lifted us above our former plane and made better men of us, by the inspiration to do better work, in the future. Especially is this true, if the circumstances are favorable for the unbending of the severer men-

tal processes, and the outward expression of the heart qualities inherent in every true man. To promote this end in an increased degree, it is suggested that this Section dine together on the evening of the first day. It were better that the hour were the usual dining hour of the place of meeting. The price of the dinner tickets should be limited to a modest sum—say two dollars each, each individual paying for his own ticket. Doubtless, if this Section found the practice pleasant and profitable, other Sections would follow, until at last the entire Association, divided by groups according to their personal tastes, would dine together. An incidental advantage of this plan is the diminution of the labor and expense attending the entertainments given the Association, by the citizens of the cities visited.

Fifth.—in many ways it would facilitate the development of this Section, to have at its disposal a complete list of all reputable physicians practicing ophthalmology in North America. This Section desires the hearty coöperation of all such, but is unable to take all the steps needful to secure it, until it has ascertained their existence and location. In this view of the situation, the preparation of such a list was commenced. It was thought that the individuals upon this should be endorsed by one or more well-known ophthalmologists, and be either a member of a State Medical Society or eligible thereto. The first step in executing the plan was to secure the aid of some ophthalmological friends in making the first list of ophthalmologists. Fortunately, I was able to secure the list prepared last year by the former President of this Section and the Secretary, Drs. Ayres and Gardiner. This included about 125 names, located in every portion of the United States. A printed copy of this was sent to each gentleman upon the list, with the request that he make such additions to it as would enable it to include every reputable physician practicing ophthalmology. On their return these names were combined, and assorted alphabetically by States. Those in each State were sent to one or more well-known ophthalmologist in that State, for revision according to the plan stated. On the receipt of these revisions, a new complete list was made, and sent to such ophthalmologists as were known to be familiar with the profession of several adjacent States, for further correction. From the returns of these lists, a last one was made and sent to the Secretary of each State Medical Society, with the request that those names be erased who were not members of the State Society, and were ineligible, and that others be added, if members of the State Society or eligible thereto, and regarded as reputable ophthalmologists. The list for New York includes those recommended by both State Societies. For our purpose it was deemed best to ignore the difference between these bodies. We

simply wanted a list of all reputable ophthalmologists, selected by competent judges. Should any person desire to eliminate those belonging to the old or the new Society, he can do so by comparing this list with that of either Society. It thus appeared that the process by which this list was constructed was tedious and complicated. The names on it have been placed there by one or more ophthalmologists, and further endorsed by the Secretary of the State Society in which the individual lives. The work was only possible through the coöperation of these numerous correspondents, and to each I publicly return my hearty thanks. Because of its incompleteness and probable errors, I have refrained from scattering it among our Fellows. If this Section, by a committee, desires to further perfect it, I shall be glad to render what assistance I may. If it regards it inexpedient so to do, I shall leave a copy with the officers of the Section, for their aid in the prosecution of their work, after I have made the final correction of the proofs, by aid of the members present.

Finally, I direct attention to the fact that so gradual has been their growth, that the Association has but partially modified its organic laws in accord with the character and importance of the Sections. Old customs by their very inertia have continued to exist when new ones are called for by the change of conditions. That the Section on ophthalmology may do its part toward making the needful changes, necessary to place the Association as a whole upon a platform in full accord with the conditions existing to-day, I venture to suggest: 1. The appointment by the Section of an executive committee of three, to join with a similar committee from each of the other Sections (when said sections shall have appointed such a committee) in forming a Council of the Sections. The object of this council shall be, in general, to secure united action by the Sections upon all matters relating to their common interests, especially to secure such action as will promote their normal development. Among these may be mentioned: the republication from *THE JOURNAL* of the work of each Section with a list of its members; an increase in the amount of time devoted to Section work; a diminution of the time and work of the general sessions; and a promotion of the social intercourse of the members of each Section with each other. Doubtless other and more important questions would come before this Council. The principle, however, would be unchanged, viz., the desirability of such organization of the Sections as would enable them to plan such changes in the conduct of the affairs of the Association as they may, by study and consultation, find needful to ensure their most complete development. The future of the Association rests with the Sections. Is it not time for them to realize this responsibility and

intelligently move forward to meet it, in accord with the state of the medical profession as it exists to-day?

If appointed this year, our executive committee could promote the formation of similar committees by the other sections, and so lead the way for the perfection of the Section Council. It could take the steps needed for the republication of our own transactions; it could arrange for a Section dinner; for the annual publication of a list of our own members; for an increase of time given to Section work. Other things doubtless it would find within its power by which it could advance the interests of this Section. As the most perfectly specialized department of medicine and surgery, it seems meet that it should take the first steps in the working out of a better future for not only itself but for the entire Association, including its Journal and the profession at large, a future in which the Association will attract to its membership every reputable physician practicing in North America, a future in which every department of the art and science of medicine shall be impelled forwards by the combined momentum of all to a degree hitherto unknown, a future in which our power shall be recognized in the laboratory, in the hospital, in the college, among the sick, and the unfortunate, but among the people as a whole as represented in legislative halls and by every intelligent individual throughout the land.

PHYSICAL CAUSES OF HEART DISEASE, AND TREATMENT.

Read before the Section of Internal Medicine, at the Tenth International Medical Congress, Berlin, 1890.

BY EPHRAIM CUTTER, A.M., M.D., LL.D.,
OF NEW YORK.

Corresponding Member Belgian and Italian Microscopical Societies;
Member of American Society of Microscopists; President American Branch Society of Science, Letters and Art, of London.

Things that increase the work of the heart are physical causes of its diseases, as follows:

A. Hæmic. That is from the blood and its vessels, including the heart itself. *B. Trophopathic*—from the food, to-wit: gases, fermentation, fatty and fibrous degeneration, catarrhs. *C. Gynecologic*—from reflex uterine irritation. *D. Motional*—as running, lifting heavy weights and climbing ascents. *E. Emotional*—as passions. *F. Postural.* *G. Heredity.* *H. Inflammatory,* etc., to name no more.

The limits allow only a brief discussion of the causes A, B, C and F. Perhaps it is best, as D, E, G and H are well understood.

We start with the idea that in health the heart can do its great work. We emphasize great, for we think few realize its greatness. It is great because, 1, unceasing; 2, of the weight of blood carried; 3, the distance carried; and 4, the mi-

croscopic smallness of the difference between the size of the capillaries and the average red corpuscles. All are familiar with the restless labor and the immense weight of blood the heart carries, so we will speak of 3 and 4. Some years ago a dentist of Boston, Dr. G. B. Harriman, said that the arteries, veins and capillaries in man, if able to be removed and connected with each other, would reach twice round the earth—that is, 48,000 miles. This was doubted, so he and I verified his statement by immersing our nude bodies in a bath-tub filled with water, and calculated the average displacement of an adult male weighing 150 lbs. to be 4,650 cubic inches. Next we calculated there would be 3,000 capillaries laid side by side in one square inch; in a cubic inch 9,000,000 capillaries one inch long, or in round numbers, 140 miles English.

On a very moderate basis, we thought we could reckon human bodies to be one-quarter capillaries. One thousand cubic inches of capillaries would give the enormous mileage of 142,000 miles, on a modest estimate, or nearly thrice the first estimate, which is overwhelming to the human intellect. But cut these figures down by other estimates, still they will not do away with the tremendous distance that the blood has to travel to do its work, and which should be borne in mind in the clinical estimates of heart disease. Suppose we come down to 1,000 miles as the estimate. It is work to circulate fluid through a tube 1,000 miles long. In health the heart does this work, but let there be added resistance from increased viscosity, and from changes in the walls of the vessels that make them rough and narrower, then think how much harder the heart has to work. The so-called "trip-hammer" beats of the heart have been found to occur where the circulation has been blocked by emboli, and are probably simply due to the heart's own efforts to propel the circulation normally.

The Heart an Autonomy.—That is to say, the heart governs the force and frequency of its pulsation very much like the governor of the steam engine—only the heart's governor lies in the ganglionic nerves that are situated in the base of the heart. They do not cerebrate like the nerve centres of the cerebrum, but they act in their way as the cerebral nerve centres act. I have had the heart beat regularly for twelve hours after entire removal from a mud turtle.

We think a careful study will sustain the autonomy of the heart as an independent nerve centre, but time forbids more explication here.

The clinical point here wished to be made, is that if the circulation is partially obstructed, whether from viscid blood or roughened vessels, the heart will have to beat harder to maintain the circulation, and thus become diseased by growing larger, as any muscle grows bigger by over-use, and if too long continued, atrophied, painful,

crampy from nervous prostration, as in writer's cramp.

The heart's work is great because there is little room for the blood corpuscles to flow through the capillaries.

What is the difference between $\frac{1}{3000}$ inch, the diameter of a capillary, and $\frac{1}{3200}$ inch, which is a little less than the average diameter of the red blood corpuscles. (It is not necessary to consider the white corpuscles, for they break up so easily into two, three, and even five segments, that they readily penetrate the capillaries.) Answer: $\frac{1}{48000}$. So that all the leeway the average red corpuscle has is less than $\frac{1}{48000}$ of an inch. A very small margin, and one liable to be used up because of its excessive microscopic minuteness. Let the blood become more viscid, or contain foreign bodies like those named, and how easy it must be to increase the work of the heart, and thus cause disease, as when the cardiac nerve centres find out there is obstruction, they use force to overcome it.

A. *Hæmic obstructions are:*

1. *In the blood.* 2. *In the blood-vessels.*

1. *In the Blood. The Morphology of the Blood in Rheumatism.*¹

Red Corpuscles: Color usually impaired, not always; coloring matter not so firmly held as in health. Are adhesive, sticky, often drawn out into elongated lozenge-shaped bodies with pointed ends, and sometimes filamentous, joining with one or more of their fellows. They clot in wirrows, ridges and huddled masses; sometimes quite formless. This is caused by the massive fibrin filaments holding them fast, as it were, in their firm meshes. The same thing is seen in consumptive blood, but to a less degree.

White Corpuscles: Usually enlarged, adhesive, sticking to each other and to the red corpuscles, and matters found in the serum. Indeed, it seems to be the office of the white corpuscles, so far as possible, to swallow and envelop any foreign substance that may find its way into the blood. Thus we find crystalline matters in the white blood corpuscles in rheumatism, though not always. They undergo amoeboid movements as in healthy blood, they have independent locomotion. Disease does not seem to impair their automatic movements. Often they are increased in number. If there is fatty degeneration going on, they will be found to contain fat in globules.

The Serum. Fibrin Filaments.—In massive, strong and sticky threads, in abundance—in meshes, which are finer than in health, visible plainly, strong, and hold the red corpuscles like prisoners—in skeins, like tangled skeins of silk—in masses forming thrombi which, when fastened, form emboli. These thrombi are apt to involve and embrace white and red corpuscles and crystalline bodies to be named below. Sometimes the fibrin filaments are found in large round strings, curled fancifully by the motion of the blood stream, and looking like the mycelial filaments of vegetations, from which they can be distinguished by an absence of entire cylindrical outline—ragged, broken edges here and there, and dichotomous and polychotomous divisions of the trunk, different from vegetations of syphilis, for example. It is the presence of these fibrin filaments that makes the bloodropy, adhesive and sticky. They have the tendency to block up the blood stream, and besides to be locally deposited in the tissues, specially when the circulation is sluggish, as near the extremities and the joints."

Crystalline Bodies, or Gravel of the Blood.—"These are numerous and readily recognized; some of them are as follows: 1. Uric acid and urates of soda. 2. Phosphates—specially the triple phosphates of lime and soda. 3. Oxalate of lime. 4. Cystine. This is quite common and easily detected. 5. Carbonate of lime, rare. 6. Stelline and stellurine. These occur mostly in granular form in the serum, but in old cases, where the system is saturated, they are crystalline. 7. Black, brown, aniline blue, bronze, orange, red and yellow pigments in the form of flakes or small masses are common in rheumatic blood, and may be termed gravelly matters that should have been eliminated by the kidneys or bowels, or skin.

"Latent Condition of the Characteristics of Rheumatic Blood.—The morphology of rheumatic blood exists in a latent condition in persons apparently well; but when they are exposed to cold, the blood-vessels contract, catch and detain these abnormal elements, and we have a stasis of the blood which may be active or passive, and manifests itself in heat, fever, pain, swelling, inflammation or passive congestion, effusion, etc., and which make up what is known as an 'attack of rheumatism.' The fever may result from the efforts of nature to get rid of the intruders, just as a householder will become hot in expelling from his premises a thief who is difficult to get rid of. Or, to use another simile, the attack of rheumatism is like the explosion of a gun. The charge in the gun is the morphology of rheumatic blood, and the cold is the pulling of the trigger. The charge may be latent in the gun for years, but it is there, with its potential energy ready to become actual from an exciting cause.

"Fibræmia.—In a nomenclature which was made before the present advance of knowledge, there is difficulty in making it fit to the new era. I shall not attempt to relieve this difficulty, but try to adapt the subject to the conventional names, as the object of this work is practical aid in treating diseases, no matter what they are called.

"Fibræmia is where the fibrin is in excess in filaments, skeins, curled massive fibres like strings, thrombi and emboli. These are in a more exaggerated condition and form than in consumption or rheumatism, and are not necessarily associated with the crystalline matters or gravel. Sometimes the fibres look like a scalp that has been taken from the head of a woman with long tresses of hair.

"Thrombosis is where masses of fibrin accrete and consolidate together, including or not the red corpuscles, white corpuscles, crystalline and pigmentary bodies, spores and mycelial filaments or vegetations, one or all.

"Embolism is where a thrombus has been caught or engaged in a blood vessel, and acts as a plug disturbing the circulation. When the embolus is made up of spores of mycoderma aceti or vinegar yeast, and is caught in the lung, it develops tubercle of the lungs, and so in other parts of the body. So senile gangrene of the extremities is caused by fibrinous clots plugging up an artery.

"Pre-embolic State.—As thrombi precede emboli, so they can be detected in the blood before the embolism, simply by the morphology of the blood. In this way, sudden deaths from embolism, specially in the puerperal state, can be averted, and this aid alone renders the microscope an invaluable assistant to the physician who is devoted to his profession."

2. HÆMIC OBSTRUCTION FROM THE CONDITION OF THE BLOOD VESSELS.

A. *Fatty Degeneration—Atheroma—Ulceration and Roughening.*—Atheroma is not always calcification. I have found it to be made up of crystals or plates of cholesterine in the aorta, thus proving a fatty degeneration caused by wrong feeding. In angina pectoris there are atheromatous deposits in the coronary arteries. May not the pain of angina pectoris come from a

¹ See Clinical Morphologies, F. Cutter.

colic or spasm of the partially paralyzed and fatigably degenerated muscles, worn out by too much work in their weak state?

B. Trophopathic Increase of Heart Work.—In 1857, Dr. B. W. Richardson, of London, fed dogs on sugar chiefly, and found deposits in the blood stream and in the heart which he termed the essence of rheumatism.

1890. My son, Dr. J. A. Cutter, and myself have found embolism in swine dying from hog cholera. Out of seventy swine, sixty died; so that feeding on vinegary foods may be set down as a cause of increasing the work of the heart by causing the morphology of rheumatic blood-atheroma, embolism and thrombosis. Food that produces carbonic acid, phosphuretted hydrogen, sulphuretted hydrogen or pure hydrogen causes a paralysis not only of the parts in contact with the gases of fermentation, but also by reflex, other organs, as for example the heart. The heart, paralyzed more or less completely, is overwhelmed, and fails to do its work. In America the newspapers term certain cases death from heart failure, showing, whether the cause of the failure is understood or not, that the great result is recognized. Gulping of wind from the stomach is often attended with death by the absorption of gases from the stomach. The mechanical pressure does not seem enough to cause instant death. Muscles partially paralyzed undergo fatty degeneration, which is a normal process in uterine subinvolution. Horses kept on high feed without proper exercise suffer muscular fatty degeneration, and become useless. Food used in excess containing carbo-hydrates or sugar produces fatty degeneration; so does phosphorus poisoning. A heart fed on starch and sugar is liable to fatty degeneration simply because the conversion of starch and sugar into fat is so easy chemically, and because of the paralyzing effects of carbonate acid gas in large excess. When a medical student, I once discharged a small stream of carbonic acid on the back of my hand. In a few minutes the spot was lead colored and insensible to prick and puncture. This occurred after the same stream had almost instantly killed a small snake in an empty glass jar.

Atheroma.—Although spoken of before, it should also have a place here, as it comes directly as a result of vegetable eating.

The morphology of rheumatism, fibræmia and consumption already alluded to, should come in here also, as they come directly from feeding of vegetable food that will ferment on it in a state of fermentation. The abnormal presence in blood of adhesive, sticky red blood corpuscles, massive fibrin filaments, single, aggregated in skeins, agglomerated in clots, free or mixed, including or not crystalline bodies, white blood or even red blood corpuscles, all are due to improper feeding as a general rule.

C. Gynic Causes of Heart Disease.—In my opinion, a large moiety of functional cardiac disturbance in women comes from uterine disease. Pains, distress, palpitation, are in my experience often in causal relations with the uterus. I have thought it was because the diseased uterus used up more force than normal, and called on the organs to make up the deficiency; hence the heart suffers often from loss of its own constitutional force in this way. The reason why I think so is because I have seen, for many years, hearts relieved by curing the uterine lesion. Indeed I feel so sure of this that I always advise a gynic exploration in such cases, feeling that even if this position is correct, there is a great gain in stopping the uses of nerve force that leaks from uterine disorders of place and substance. For example, Dr. Bowditch, of Boston, sent a woman to me in consumption, complaining greatly of severe pain over the precordium, combined with violent action. I suspected uterine reflex, and found complete anteversion, with hyperæsthesia of the uterus. A few iodoform capsules relieved the hyperæsthesia and replacement relieved the anteversion; with this relief went the cardiac symptoms. Suppose the woman has organic disease of the heart, the gynic disease aggravates it often. I am quite aware that chest specialists may be, and are, surprised at this statement, as it rather clashes with the conventional idea of specialism that the specialist must not go out of his domain; but as the gynic causes are great factors in cardiac disease, neither they nor trophopathics should be neglected by the specialist, unless he wants to be a nonentity and failure. It is high time that all specialists recognize the gynic reflex and systemic causes of special disease. Ten years ago I called attention to the connection of the uterus and the throat, and was laughed at for my pains; now the idea is adopted.

F. Postural.—In persons compelled to stand erect, as American street-car drivers. (In Europe they are more humane, and allow these workers to sit; may it be so in America!) Here the work of the heart is done against a pressure of blood column high as the head. The effect is seen in the varicose veins of the legs, and must increase the work of the heart. Indeed, I have seen the reports of drivers falling over the dasher, run over and killed. It is very probable that the falls would not have occurred unless the heart had given out in a faint. When we sit, the height of the blood column is diminished by the length of the thigh.

In the horizontal position the blood pressure is taken off, and only the flow of the blood is carried on.

But if the legs are elevated, then the weight of the blood is added to the direction of the stream, and eases the heart greatly, forming a most im-

portant element in rest. I have known a man with hypertrophy and valvular lesion, who could not sleep in bed for thirty minutes at night, when placed on a resting chair, in which the feet were gradually brought higher than the head, to get in two days so much rest to his diseased heart that he slept all night in bed. This shows what a work it is for the heart to beat when the body occupies erect postures.

TREATMENT.

A. Conventional is to sedate or quiet the heart by medicine and local treatment, with no view of any positive cure, only to make the patient more comfortable, and smooth the pathway to the tomb. While this may be desirable, is it doing all that can be done? And is this conventional treatment on the right principle? I think not; and my opinion is based on the facts just given, and, as a person whose parents both died of heart disease suddenly, I give here what I believe to be:

B. The Rational Treatment of Heart Disease, by removing causes, which are:

a, hæmic; *b*, trophopathic; *c*, gynecic; *d*, motional; *e*, emotional; *f*, postural; *g*, hereditary, and *h*, inflammatory; *i*, oiling the machine with medicine, and nature, who is all the time trying to cure all disease, will then arrest and cure. It is not rational, when the heart is growing large because of its increased work, to tone down and quiet the heart, unless at the same time measures are taken to stop the causes of that very increased work.

The writer has seen so many cases where stopping the causes has been followed by permanent cures that he thinks this is the rational way to treat such cases.

a. Hæmic causes, treatment same as b. Trophopathic. (a) Remove causes; (b) build up the system on food which does not have the alcoholic or vinegar fermentation; (c) use medicines as aids, helps, assistants, but not with the view that they alone can cure.

(a) *Remove Causes*; that is, the vinegar plants, the thrombi clots, the stickiness of the corpuscles, the fibrin filaments in excess, as to size, strength and skeins. This is done by stopping the fermenting food.

(b) *Build up the System* on food which does not undergo the alcoholic or vinegar fermentation. Beef is digested in the stomach; digests easiest, quickest and assimilates best; feeds all the tissues well, and can be lived on for years, as hundreds have proved. Unchopped beef answers in some cases, but in those who have been physiologically erring for many years, even the white fibrous tissues of the unchopped meat ferments like the vegetable food, and great advantages come from removing this connective tissue fiber. The American and Enterprise chopper are the best for this purpose. The muscle pulp

is moulded into cakes like fish-balls, broiled and seasoned with pepper, butter and salt, and eaten hot. (The cakes must not be moulded by hand, but with a knife and fork, so that the meat may not be too tightly pressed together; if it is, the meat will be livery and gelatinous, and apt to produce diarrhœa.) If properly prepared, it is palatable. No other food ere the fermentation ceases, except relishes of lemon juice and celery, the latter in small quantities, until the heart gets into better shape. The moment the blood stream is normal, that moment the heart improves. The moment the paralyzing gases are removed and kept away, that moment the heart improves obviously. By the autonomy of the heart, or by the *vis mediatrix naturæ*, the heart is on the road to restoration by first stopping the accumulation of the thrombi; second, by their solution in the stream of normal blood; third, by their consequent disappearance by absorption; fourth, as our bodies change all the time, our hearts change with them, of course, and by stopping the causes of deterioration, and furnishing a supply of healthy food in abundance, the new structures of the heart are laid down normally.

(c) *Medicines are aids* and help to oil the machinery. For example: Some cases will get well on diet alone, but medicines are usually an aid.

They may be classed as follows:

1. *Hot water* at the temperature of tea and coffee, to be drank one or two hours before meals and on retiring to bed, in quantities of from one-half to one pint at each drinking.

This hot water promotes peristalsis downwards, washes out the digestive organs soured with swill, vinegar, etc., then the blood and secretions; washes out the kidneys, liver and skin, cleanses the foul system, causes eructation of paralyzing gases, and can be used successfully when death seems imminent from heart failure. The use of pure spring water is advised, or distilled water, as being free from organic life, and more able to dissolve out the crystalline bodies that are formed in the blood of thrombosis.

2. A good vegetable tonic of fluid extracts, such as are not poisonous, to be taken before meals to tone up the digestive organs. A combination of several ingredients works well in many cases. Strychnia, digitalis and strophanthus can be used to good effect, but as indicated by the special case.

3. Some non-sugary pepsin and pancreatine after meals to help digest the food is an excellent idea.

4. Ammonia or alcohol sponge-baths night and morning help, as the skin is the largest gland in the body, and does a great amount of excreting work. It is vicarious in function with the digestive organs, lungs, kidneys, etc. It must be kept in good trim.

5. Rubbing, massage and passive exercise, as

riding and driving, are excellent aids to help the machine run better.

c. *Gynic.*—Make local examinations, and, having found out the difficulty, treat accordingly. In passing, I might say that I have found great advantage in the use of, 1, vaginal gelatine capsules filled with iodoform or iodol, and retained by absorbent cotton; 2, iodoform or iodol in uterine cavity to relieve the hyperæsthesia—the best of anything if used with care; indeed, I would not know how to do without them; so far aristol and other chemicals have not superseded iodoformis sedating powders; 3, platinum-plated uterine sound, also good to relieve lesions of place. My own pessaries, specially the stem.

d. *Motional.*—When going up stairs, the force thrown on to the heart is four to ten times as much as when locomotion on a level at the same rate of speed. Hence patients, in going up stairs, should count four between each step, or even ten; this gives the heart good usage. I asked a mill owner what would be the result if suddenly he turned four times the usual work on to his 250-horse power steam engine. He said it would be broken. And yet this is done to the heart all the while, and worse still, as the rate of speed is usually more in going up stairs than on a level.

e. *The Morale of the Patient Must be Cared for.*—He must understand why he does as he does; that if he transgresses, his sin will find him out in the heightened color of his urine, in the gas in the stomach, the heart symptoms re-appearing, and in a general fretful, fault-finding disposition with everything, which he will manifest. He should be cheerful and hopeful; make up his mind to get well, and then not worry, overwork or excite. Let the sympathetic nerves run unhindered. He should not live in his head. He should be very careful about exercise, remembering that the heart takes strength to get well, and to run the body in health. Tell him that it is work to live when sick, as it is more work to run a machine, a locomotive, pair of scissors, etc., when bearings need oiling, than when lubricated; hence, patients should take time and rest to get well. The physician should be in constant communication with the patient, and should often examine the blood, urine and fæces to know how the system is running, and to correct any mistake as soon as detected. He should inform the patient that he is on plans that must be studied. The physician must believe, and make the patient believe, in the truth of the plans. He should not hunt to find something that is going to kill the patient, but should look for things to cure. Nor should they make up their mind that the patient is going to die.

f. *Postural.*—Place patient on a chair that has the motions of the leg and thigh in vertical planes. The feet can be put higher than the

head, and thus rest the heart. This acts well in practice.

g. *Heredity.*—These are best controlled by food plans for the benefit of posterity.

h. *Inflammatory.*—By posture, diet and depleting remedies, like veratrum.

Finally, the physician directs, the patient obeys, and nature effects the desired end—a healthy heart.

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VOMITING OF PREGNANCY; ITS ETIOLOGY AND TREATMENT.

Read before the Allegheny County Medical Society, June 16, 1891.

BY F. BLUME, M.D.,
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Pregnancy, as a rule, is complicated with a variety of disorders, which, though in many instances causing much discomfort, are termed physiological as long as they are not associated with serious disturbances of the organism. Derangements of the gastro-intestinal canal, nausea and vomiting, to the consideration of which I invite your attention to-night, are such a regular occurrence during the early period of pregnancy that experienced women consider them as positive signs of conception.

The so-called morning sickness—nausea and vomiting early in the morning, or even after meals, during the first few months of gestation—have, in the large majority of cases, no effect either upon the course of pregnancy or upon the health of women. Although the ordinary morning sickness sometimes persists during the whole period of pregnancy, it remains endurable, causing the patient rather annoyance than injury. There are intermissions, either spontaneously or the consequence of some treatment; the digestive functions remain more or less normal, and the vitality of the patient is not essentially impaired. In some, fortunately very rare instances, however, nausea and vomiting become incessant and uncontrollable, the stomach rejects everything, the patient grows weaker till the most extreme degree of exhaustion is reached, and death from starvation threatens.

The onset of this grave form of the affection is gradual, and does not differ in character from the usual morning sickness. But soon the nausea becomes more intense, the vomiting more frequent. The ejected matter consists of food, mucus and bile. The appetite is more or less impaired or perverted; the thirst is excessive; constipation is more frequent than diarrhœa; the urine is scanty, concentrated, and contains albumen and casts. The pulse grows small and rapid, the temperature rises, and continued fever develops.

With the progress of the disease the condition of the patient becomes more and more alarming. The nausea is almost constant, adding greatly to the discomfort of the woman. The efforts at vomiting are accompanied by violent retching and pain; not the smallest amount of food or drink is retained by the rebellious stomach; the smell, even the thought of nourishment, or the slightest movement of the patient, induces an attack. The vomited matter is finally mixed with blood. The thirst is tormenting, the throat and mouth are dry, the tongue brownish, the breath fetid, the abdomen tympanitic. The consequences of this continued suffering soon become very pronounced by the marked alteration of the features, the extreme emaciation and the profound depression of the patient. Shortly before life ends, vomiting ceases and coma supervenes.

Cases of persistent vomiting, which terminate fatally, are certainly very rare. Even after the application of various methods of treatment has failed to influence the course of the disease, and while the induction of abortion was earnestly considered, the patients have recovered spontaneously, and have gone to full term, as I have seen in the only instance of this grave disorder which has come under my observation.

There is considerable diversity of opinion as to the causes which may incite hyperemesis, and, in spite of numerous theories and hypotheses, the etiology of this disorder is by no means clear. It is almost universally accepted to be a reflex neurosis originating in the uterus, and dependent either upon pregnancy alone or upon co-existent pathological conditions.

Pregnancy itself, the growing ovum, which acts as an irritant by the simple mechanical distension of the uterine cavity and its peritoneal covering, is in the first place to be mentioned as the most potent etiological factor.

Cases of multiple pregnancy and hydramnion, which present a disproportion between the passive distension and the active growth of the uterus, and which frequently are complicated with hyperemesis, confirm this view. Moreover, the induction of artificial abortion, our last resource in desperate cases, which almost immediately relieves the patient when done in time, is founded upon this theory of passive uterine distension, and strongly supports it.

Spontaneous death of the fœtus, followed by immediate or remote abortion, is another remarkable fact in favor of this view.

A patient of mine, the mother of two children, was suffering from double laceration of the cervix, erosion and endometritis. She refused surgical treatment, and was relieved by repeated irrigations of the uterus with carbolyzed water, and by the application of tincture of iodine. She soon afterward conceived, and her pregnancy was complicated with the ordinary morning-

sickness from the second month to the beginning of the sixth, when the vomiting suddenly ceased. Two weeks thereafter she told me that she did no longer feel the movements of the fœtus, that vomiting had ceased, and that she therefore believed the child was dead. Though I could not detect the fœtal heart-sounds, I gave my opinion with reserve. Three and a half months later I delivered her of a dead fœtus about five months old.

This case affords the most striking evidence of the discontinuance of reflex symptoms after the removal of the inciting cause. We have here pregnancy complicated with pathological conditions of the uterus, as double laceration of the cervix, ectropium, and probably a but partially cured endometritis, conditions which existed prior to conception and continued after the death of the fœtus. But in spite of the persistence of these pathological conditions of the uterus, and of the retention of the dead fœtus for almost four months, the vomiting disappeared with the death of the fœtus, that is, with the cessation of the mechanical distension of the uterine cavity.

The influence of primary gravidity is demonstrated by the fact that hyperemesis in its grave forms is essentially an affection of primiparous women, and it is to be referred to the greater resistance of the virginal uterus.

Numerous other causes are given as etiological factors by different observers, among them: pathological conditions of the cervix, chronic metritis and endometritis, displacements of the uterus, inflammations of the pelvic peritoneum and connective tissue, ovarian neurosis, neurotic predisposition, hysteria, and lastly, diseases of the gastro-intestinal canal, especially gastric ulcer, chronic gastritis and constipation.

Morbid changes of the uterus are frequently the cause of reflex neuroses in non-pregnant women. The dependence of gastric disturbances upon the irritability of the uterine nerve-fibers, due to flexion and version of the uterus, to an eroded and congested cervix, to metritis and endometritis, has, in many instances, evidently been proven. Relief has been obtained by the removal of the exciting cause, by the treatment of the uterine diseases after gastric medication had been tried again and again and had failed entirely.

Bearing in mind the physiological changes of the uterus during the pregnant state, its increased functional activity, the influence exerted by gestation upon the nervous system, and the relation between the neuroses and the disorders of the reproductive organs, so often conclusively proven in non-gravid women, we are compelled to acknowledge the various pathological conditions of the uterus as prominent etiological factors deserving our earnest attention. Cases are on record where the application of caustics to

the eroded cervix, scarification of the congested vaginal portion, dilatation of the cervical canal, correction of a flexion, have proven successful in stopping the vomiting, and thus demonstrated the connection between the uterine lesion and the reflex nerve action. In other instances, however, the result of the gynecological treatment has not been so satisfactory, either transitory or no relief has been obtained, and, as a consequence, the influence of the uterine disorders upon the gastric phenomena, their importance as the causative diseases has been questioned.

Undoubtedly it will be often found difficult to decide whether the symptoms result from physiological or pathological causes; whether they are due to distension of the uterus or to morbid changes in the sexual organs. All methods of treatment, artificial abortion excepted, may fail to relieve the patient, and she finally may get well by absolute rest and complete abstinence, to the surprise of her medical attendant.

Such cases are certainly rare, while, on the other hand, there is abundant clinical evidence of the effect of local treatment. Numerous women have been benefited by the treatment of the uterine lesion; the reflex symptoms have been mitigated or cured by the improvement of the causative disease, and the connection between both has thereby been confirmed.

Attention has been drawn to the importance of endometritis as an etiological factor by F. Veit,¹ who reported three cases of uncontrollable vomiting, where he was compelled to interrupt pregnancy, and where he found inflammatory processes in the decidua, serotina and vera. Veit believes that by his researches the dependence of hyperemesis upon endometritis is positively proven, as a rule the endometritis exists prior to gestation, the symptoms are but insignificant, become palpable, however, with the beginning of pregnancy, which frequently is interrupted by this complication. In many instances the endometritis decidua will be found to be the cause of the uncontrollable vomiting; the connection through sympathetic paths must be the same as between gastric disorders and endometritis in non-gravid women. The evidence of an anatomical base, he continues, renders a most careful examination of the uterus imperative, and, if the diagnosis of endometritis, which is very difficult before the removal of the ovum, can be made out, it may be of determining influence as regards the advisability of inducing abortion.

Quite recently E. H. Grandin,² discussing this subject in the New York Obstetrical Society, suggested ovarian neurosis, pressure on unusually hyperesthetic ovaries as a cause of hyperemesis. This view, he says, would be suggested by Dr. Coe's case, which showed that the physiolog-

ical vomiting of pregnancy could be palliated by teaching the patient to assume the genu-pectoral position before rising, and as often during the day as necessary. He would explain the vomiting of pregnancy, then, by the fact that during the early months the uterus lay low in the pelvis and pressed on the ovaries; at the third month when the vomiting usually ceased, the uterus rose above the pelvic brim. In cases of pernicious vomiting it was possible the ovaries were either enlarged through disease or had become impacted between the pelvic brim and the lower uterine segment.

Grandin's theory, though it may be applicable to a given case, will probably not be favorably accepted. To-day the view is predominant that reflex neuroses may originate in the uterus, and not in the ovary. The removal of normal ovaries for the relief of reflex symptoms is at present restricted to exceptional cases, and it is believed that if a satisfactory result is obtained by the operation, this is due to the changes in the condition of the uterus, to the artificial induction of the menopause, resulting from oöphorectomy. Clinical evidence supports this view.

Grandin's explanation, however, may prove valuable in so far as to induce us to carefully examine the ovaries in cases of hyperemesis. Pro-lapsed ovaries are by no means a rare affection, but it remains to be demonstrated whether pressure exerted upon them by the enlarged uterus stands in causal relation to gastric disturbances.

Nervous disposition and hysteria, so frequently met with among women of the better classes, add greatly to the discomfort of pregnancy, and, though there are certainly many exceptions, must be considered as prominent predisposing factors of the graver forms of vomiting.

The importance of diseases of the gastro-intestinal canal, especially of gastric ulcers, is emphasized by various authors. According to Horwitz³ "hyperemesis develops in some cases complicated with more or less pathological changes of the stomach and of the intestines. The greater the disturbance in the alimentary canal the easier the ordinary vomiting takes on the character of the uncontrollable form."

The diagnosis of vomiting of pregnancy is by no means as easy as one might think at first sight. While the dependence of this disorder upon the pregnant state may often be determined without much difficulty, cases—especially of the graver forms—may present themselves where this will be found impossible, and where the diagnosis, therefore, must remain doubtful. Faggard⁴ directs our attention to the fact "that so few cases of pernicious vomiting are recorded in German medical literature that the existence of this affection is even questioned." Carl Braun, in a

² American Journal of Obstetrics, 1890, p. 1382.

¹ Berliner Clinische Wochenschrift, 1887, p. 643.

³ Praktischer Arzt, 1882, p. 261.

⁴ American System of Obstetrics, Vol. I, p. 411, 415.

bulous experience of over one hundred and fifty thousand obstetrical cases, has never observed a single fatal termination. On the other hand, Robert Barnes has himself seen 9 fatal cases. McClintock collected close on 50 cases, and O. W. Doe 48 cases with 18 deaths occurring within the last fifteen years, and registered in American and English journals. Gueniot records 8 cases with 46 deaths.

It is not at all improbable, Faggard continues, that the difference of opinion as to the frequency of this disorder between the Germans on the one hand, and the American, French and English observers on the other, depends, in a large measure, upon the difference in diagnostic criteria instituted upon by the respective schools. In the majority of the fatal cases of alleged hyperemesis due to pregnancy reported by American, French and English observers, there is a notable absence of reliable records of post-mortem examinations. In the few cases collected by the Germans, on the other hand, the diagnosis during life has almost invariably been confirmed or negatived by exact investigation of the dead body. Horocks pertinently remarks: "Where there has been no post-mortem examination in a fatal case of vomiting, I do not think that one is entitled to say that pregnancy caused the fatal vomiting. It may have been the cause, and the only cause, or it may have been an aggravation of some other cause, or it may have had nothing to do with it. Scepticism as to the alleged frequency of this disorder, in the present state of our knowledge, accordingly eminently in order."

According to Gueniot,⁵ three distinct factors are to be taken into consideration in making the diagnosis of vomiting of pregnancy: 1. The diagnosis of pregnancy; 2. The diagnosis of the juxta or determining cause of the vomiting; 3. The differential diagnosis between obstinate vomiting due to pregnancy, and that due to other causes independent of gestation.

It is both interesting and instructive to learn that errors in diagnosis have been made even by eminent clinicians. Thus Faggard⁶ tells us that Rousseau once diagnosticated uncontrollable vomiting, and induced abortion, in a case in which the autopsy revealed cancer of the stomach. Beau erred in diagnosis in a case in which the post-mortem examination showed tubercular meningitis as the probable cause of the vomiting, and Cazeaux narrates the history of a fatal case of alleged hyperemesis of pregnancy where the autopsy disclosed tubercular peritonitis and the absence of pregnancy.

But a mistake in diagnosis is possible even in the other direction—that is, pregnancy may be denied by the patient or not be expected by the physician, and thus be overlooked, as shown in

a case recently reported by A. H. Buckmaster.⁷ The patient, a governess in a respectable family, was supposed to be suffering from vomiting due to ulcer of the stomach, and was under treatment two months, when she died. In making the autopsy a five months' foetus was found, but no ulcer whatever, nothing to account for death except the uncontrollable vomiting of pregnancy.

These cases need no comment. I have cited them to demonstrate both the difficulty and the importance of an accurate diagnosis.

It is generally stated that the prognosis of hyperemesis is bad, but this, apparently, is by no means correct. As Faggard justly remarks, "it is doubtful whether an authentic fatal case of this kind is recorded. Such cases have never been seen by observers of the largest experience."

Even the graver forms of this disease yield, as a rule, to rational treatment, unless they are complicated by serious pathological conditions which of themselves render recovery impossible. Pregnancy may aggravate such cases, and perhaps hasten death, but it must be admitted that there exists no causative relation between gestation and the lethal issue.

A great variety of remedies—still increasing in number every year—have been recommended by different writers. These remedies have proven satisfactory in some cases, but failed entirely in others. This uncertainty of the various methods of treatment, the often but little annoyance caused by the milder forms of vomiting, and the experience that in many instances spontaneous cures occur, have led to the view that interference is not required unless the case presents a more serious aspect. Such advice given in text-books is, at first sight, surprising. Even in mild cases of gastric trouble a careful examination is indicated, and should be insisted upon by the medical attendant, to determine the cause of the disorder, its dependence upon physiological or pathological conditions. Are the generative organs found to be normal? Are there no indications of diseases of other vital organs, especially of the stomach? Is the effect of the vomiting upon the general health but insignificant? It may then be decided whether it be a wise plan to irritate the stomach by various drugs, which, as known from experience, are of so limited value in this reflex affection, or to desist from treatment. It is in this sense, I take it, that such advice has been given, and it is under these circumstances that it deserves recommendation. Nevertheless, such statements in text-books are misleading, fortunately, but to the superficial reader.

While mild cases of vomiting do well without treatment, diet and regulation of the bowels are usually sufficient to render the gastric disturbances tolerable, but the persistent vomiting demands our earnest attention.

⁵ Faggard, American System of Obstetrics, Vol. i, p. 416.

⁶ Loc. cit.

⁷ American Journal of Obstetrics, 1890, p. 1381.

Hyperemesis, a reflex neurosis, is either due to physiological changes in the uterus, distension by the growing ovum, or to pathological conditions complicating pregnancy. If we exclude co-existent diseases of the stomach, which will be considered later on, it must seem plausible that the treatment should be directed against the causes and not against the symptoms of the gastric disorder; that is, against the uterus, and not against the stomach. The stomach is not the diseased organ. Nausea and vomiting of pregnancy are only the symptoms of some functional disturbance of the nervous system, originating in the uterus, like the nausea and vomiting of sea-sickness, an analagous disease, dependent upon the motion of the ship. For this reason gastric medication must fail to favorably influence hyperemesis; for this reason none of the innumerable remedies recommended are found to be reliable—some of them are worse than useless.

There are three classes of cases, however, which sometimes may be relieved by the administration of drugs, viz.: 1. Women who, prior to gestation, have been afflicted with diseases of the stomach, as chronic gastritis and gastric ulcer; 2. Women of an unusual nervous irritability; and 3. Hysterical women.

In cases of the first category sub-nitrate of bismuth, bicarbonate of sodium, Carlsbad water, oxalate of cerium, the tincture of nux vomica, etc., may be tried and may sometimes be found of decided value, while the nervines and sedatives may give relief to nervous and hysterical women. Opium and its preparations, the bromides and chloral, either administered by the mouth, by the rectum, or hypodermically, as the circumstances require, are the medicinal agents which have the best reputation, and which, in these cases, sometimes successfully depress the reflex irritability, and thus alleviate the symptoms. Blisters, the application of chloroform, ether, and of the faradic current to the epigastrium, of the ice-bag to the dorso-lumbar region have been tried and have afforded relief in some instances.

The resort to local treatment is indicated in all those cases in which a morbid condition of the uterus has been made out. Retroflexion and retroversion are to be corrected, and, if necessary, the uterus is to be retained in position by a suitable pessary. A congested vaginal portion may be relieved by scarifications, while the application of carbolic acid, or of a 10 per cent. solution of nitrate of silver to the eroded cervix will often prove successful in mitigating the distressing symptoms. Faggard⁸ states that in Vienna a 10 per cent. solution of nitrate of silver is employed in all cases of severe vomiting, irrespective of the condition of the vaginal portion. "The weight of testimony in favor of this simple pro-

cedure, collected from innumerable sources, is so great as to make its employment absolutely obligatory before resorting to more radical methods."

Dilatation of the cervix—Copeman's method—has proven successful according to some writers while others report negative results. In the only case of severe vomiting which I have observed had a most remarkable effect. The nausea disappeared instantly, but only for a few hours. The method was again applied, but no result was obtained the second time.

Horwitz⁹ recommends that in the severer case of vomiting the patient should be placed at rest in bed in the horizontal position, that the room be darkened, and that, if the stomach reject everything, rectal alimentation should be resorted to. Crushed ice to quench the thirst is allowable. I can fully endorse this plan.

When these various methods have failed, when the vomiting actually is uncontrollable and seriously endangers the patient's life, the induction of abortion or premature labor is indicated, and will, if done in time, to a certainty save the woman.

CONGRESS FOR THE STUDY OF TUBERCULOSIS.—On July 17, this Congress was inaugurated by a visit to Professor Lannelongue's wards at the Hôpital Trousseau where the cases treated according to the new chlorid of zinc method were passed in review. Later, the first meeting was held at the Faculty of Medicine, under the Presidency of the veteran Villemin. About 400 members were present to listen to addresses by Professor Verneuil, Grancher and Arloing. The latter inquired gave experimental proof of the inefficiency in the laboratory of Koch's tuberculin. Meetings were held on the 28th, 29th, 30th and 31st, and visits were paid to Professor Verneuil's wards at the Hotel Dieu, where patients treated by injections of iodoformed ether were presented to the Val-de-Grâce Military Hospital, to see the cases treated by creasoted oil; and to the Institut Pasteur. A grand banquet took place on Thursday evening. In connection with this subject, the *Progrès Médical* revived the question of the disinfection of railway carriages employed for the conveyance of phthisical visitors to the southern health resorts. Prausnitz is quoted as having examined the dust of *coupés* on the express train doing the service between Berlin and Meran—a route much frequented by consumptives. He inoculated this dust into guinea pigs according to the serial method of Cornet and found that two out of five *coupés* contained the tuberculous bacillus. The journal above mentioned urges the Paris-Lyon-Méditerranée Compagnie to provide—at least for the better class of travelers—antiseptic spittoons.—*Boston Med. and Surg. Journal*.

⁹ Loc cit.

⁸ Loc. cit.

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BY-LAW IV.—THE PUBLICATION OF PAPERS AND
REPORTS.

No report or other paper shall be entitled to publication in the
same for the year in which it shall be presented to the Associa-
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LONDON OFFICE, 57 AND 59 LUDGATE HILL.

SATURDAY, AUGUST 22, 1891.

THE GERMS OF TYPHOID FEVER.

The lectures delivered at the post-graduate
course at Toronto last winter, have reached us
in pamphlet form. Among them is one by PROF.
ROBERT C. VAUGHAN under the above caption.
After reviewing the work which has been done
by various investigators as to the presence of the
Koch-Eberth germ in typhoid fever, and the
attempts to inoculate lower animals with it, he
sums up as follows:

1. A germ giving the tests supposed to be
characteristic of the Eberth germ is found in-
variably in the bodies of those dead from typhoid
fever.
2. It has been isolated and grown in pure
cultures.
3. All attempts to induce typhoid fever in the
lower animals by inoculation with this germ
have so far been without success.
4. Experiments show not only that the germ
is able to multiply in the lower animals, but that,
when introduced by inoculation, it soon dies.

The failure of the inoculation experiments
may be due to insusceptibility on the part of the
lower animals, or the germ employed may not be
the cause of typhoid fever.

HUGUENIN, as quoted by MURCHISON, says
that enteric fever with characteristic intestinal
lesions is by no means uncommon among cattle
in Switzerland. In 1882, BRAUTLECHT inocu-
lated rabbits with germs from water supposed to
be the cause of a typhoid epidemic, and pro-
duced in them a wasting febrile disorder lasting
from two to eight weeks, with the post-mortem
evidences of severe catarrh of the small intestine.
The intestinal walls were thickened and friable,
the mucous membrane swollen, yellowish, and
reticulated; ulceration was present in some
cases, but was generally confined to individual
glands. There was marked enlargement and
coloration of the spleen and mesenteric glands.
In 1885, SEMMER reported typhoid fever in three
dogs and a horse, in which the lesions were well
marked. From this it would appear that the
disease probably occurs in the lower animals, and
the failure of the inoculation experiments can-
not be explained by assuming the contrary.

VAUGHAN'S own work on the subject is of
value, particularly as to the sufficiency of the
identification of the KOCH-EBERTH bacillus.
The KOCH-EBERTH germ is said to be identified
by its resistance to stains and by its invisible
growth on potato.

Two germs which VAUGHAN has frequently
found in drinking water, and which he desig-
nates as bacillus A, and bacillus B, are under
ordinary circumstances very readily distinguished
from the KOCH-EBERTH germ. But VAUGHAN
grew these germs on healthy human spleen, at
temperatures of 39° C. to 40° C. (102.2° F. to 104°
F.), and made cultures from them from time to
time. After seven days bacillus A was so modi-
fied that its growth on potato could not be dis-
tinguished from that of the KOCH-EBERTH germ.
And after fourteen days, it did not take stains
even as deeply as the KOCH-EBERTH germ. Sim-
ilar results were obtained from bacillus B.

RODET and ROUX in 1890 found that the bacte-
rium coli commune when cultivated at a temper-
ature of 44° C. to 46° C. acquired a close resem-
blance to EBERTH'S germ.

VAUGHAN concludes that we must abandon
the belief that typhoid fever is due at all times to
one and the same germ which can be recognized
by certain peculiarities in staining or in manner
of growth.

Whether this conclusion will be generally ad-

mitted or not, we must agree that the experiments of VAUGHAN and those of RODET and ROUX show that the characteristics by which it has been sought to recognize the Koch-Eberth germ, can be acquired by some other germs by exposure to continuous high temperature, that is to say, to fever temperature. These experiments do not show, however, that the germ originally described by EBERTH was not the cause of typhoid fever, although they throw doubt, in fact almost render valueless, observations relating to the germ, which have included as their means of recognition its peculiar growth on potato and its relation to staining agents.

It would seem also that it has not yet been shown beyond doubt that the lower animals are the subject of true enteric fever.

PANCREATIC DIGESTION OF FATS.

Last week we referred to the work of GAD and RACHFORD on the formation of spontaneous emulsions. They found that if a drop of oil containing $5\frac{1}{2}$ per cent. of fatty acid was dropped upon a $\frac{1}{4}$ per cent. sodium carbonate solution, a spontaneous emulsion was formed. Using this method in the investigation of the pancreatic digestion of fats, RACHFORD discovered some very interesting and valuable facts. Discouraged by HEIDENHAIN'S attempts to make permanent pancreatic fistulæ in dogs, he made use of temporary fistulæ in rabbits, in this way always securing fresh juice for his experiments. The portion of the duodenum containing the end of the pancreatic duct was resected, brought to the surface of the abdomen, and the pure juice obtained through a glass canula inserted into the open end of the duct. Taking the pancreatic juice so obtained, it was shaken up with neutral olive oil for a moment, and then the two allowed to separate. A drop from the supernatant oil was then pipetted off and dropped upon a $\frac{1}{4}$ per cent. solution of sodium carbonate. This operation was repeated every three minutes until a perfect spontaneous emulsion was formed. As an average of his experiments, he found that about twenty minutes was required to form the perfect emulsion under these circumstances; or, in other words, the juice would produce $5\frac{1}{2}$ per cent. of fatty acid in the oil in twenty minutes. These experiments were conducted at the ordinary temperature of

the room, 18° C. (64.4 F.). When the mixture of the oil and juice was kept at the temperature of the body, the fat-splitting activity of the juice was doubled, and the $5\frac{1}{2}$ per cent. of fatty acid was formed in about ten minutes. The emulsions formed in this way had all the peculiarities of the emulsions formed with neutral oil, to which a definite amount of fatty acid had been added and sodium carbonate solution, to which we referred last week. The most important feature of his experiments, perhaps, was his determination of the influence which the other digestive agents had upon the fat-splitting properties of the pancreatic juice. Representing the activity of the juice at room temperature by 20, the addition of dilute hydrochloric acid was found to reduce this activity to 13, while the addition of the principal constituent of the bile, viz., the glycocholate of soda, increased it to 44. When the glycocholate of soda and hydrochloric acid were both added, the activity was still further increased being represented by 56. That the other ingredients of the bile were not unimportant in this connection was shown by the fact that the juice and bile alone had an activity of 64. The greatest effect, however, was obtained by a mixture of pancreatic juice, bile and hydrochloric acid, the activity of the mixture being 80, or four times that of the pancreatic juice alone.

RACHFORD'S experiments show very clearly that the bile does not assist in the emulsification of fats as has been so long taught, but, on the contrary, directly interferes with the emulsification while it does assist powerfully in decomposing the fats into glycerine and fatty acids.

It has been the custom of late to study the digestive ferments separately, in order to obtain so-called accurate information, but these experiments certainly indicate that the combined action of these ferments may give strikingly different results from what their separate actions would indicate.

BEQUESTS TO HOSPITALS.—Under wills recently probated the following institutions obtain liberal gifts: The Grady Memorial Hospital of Atlanta, Ga., receives \$7,500 from the estate of the late William A. Moore, and the Rhode Island Hospital, at Providence, \$80,000, as a legacy of the late J. Wilson Smith.

THE COLLAPSE OF FATHER MALLINGER.

It is reported that FATHER MALLINGER, the alleged faith-healing priest of Troy Hill, Pittsburg, has been enabled to lay up earthly treasure to the amount of \$3,000,000. The Pittsburg papers have apparently found a satisfactory explanation for the Father's erratic course in the fact that he has a good knowledge of the healing art, having regularly graduated in medicine in Germany, and having been a country practitioner before the time of his entering holy orders. He gives medicines in many cases and the patients are bidden to send to him to have them renewed. The nature of his materia medica has not been made known.

In regard to the *fiasco* which occurred on St. Anthony's day, there can be little doubt that lives were lost rather than saved, as the unfortunate pilgrims to Mount Troy were led to believe and hope would be the case. Several deaths were reported as having occurred very soon after that day, probably caused by the excitement and resultant depression naturally following the pilgrimages of many from a distance, and undue mental and physical strain. Many of these hopeful pilgrims were of the poorest classes, and spent their little all in this final grand effort to obtain a cure, so that many of them must have been made worse by their journeyings, even if they did not die by the way. The newspaper reports, who did so much to raise the senseless and sensational expectations of the unfortunates, have of late been engaged in ferreting out the alleged marvelous "cures" and in demonstrating that most of the cured persons "are still far from being well."

ORTHOPÆDIC SURGERY DEFINED.

In the twenty-third annual report of the New York Orthopædic Dispensary, DR. NEWTON M. HAFFER offers the following comprehensive definition of the province of orthopædic surgery: It is that department of surgery which includes the prevention, the mechanical treatment and the operative treatment of chronic or progressive deformities, for the proper treatment of which special forms of apparatus or special mechanical dressings are necessary." The underlying thought which dictates the above definition implies that the fully qualified orthopædist shall be prepared to do surgical operations in that range

of cases where special mechanical measures must be employed after those operations, but the operative treatment must stand in a position secondary to the mechanical; and the conservative element is seen in the union of the two treatments. Those deformities which general surgery is competent to relieve at once, or without the intervention of mechanico-therapy, are excepted under the foregoing definition.

MARION-SIMS MEDICAL COLLEGE IS IN LINE.—At a recent meeting of the Faculty of the Marion-Sims College of Medicine, the Dean, Dr. Young H. Bond, introduced the following resolutions, which were unanimously adopted:

WHEREAS, The position taken by this college upon the two questions of Medical Legislation and Medical Education, has been intentionally confounded, and

WHEREAS, Notwithstanding the fact that, at the last meeting of the Missouri State Medical Association, the report on Medical Education offered by Dr. McAlester, and having as its central idea a three years' graded course of lectures, was, on motion of your Dean, with the aid of the votes of all the members of this Faculty then present, adopted, it has been sought to have it appear that this college is not favorable to higher Medical Education. Therefore, to the end that our position upon the question of Medical Education be clearly understood, be it

Resolved, That after the session of 1891-'92, the Marion-Sims College of Medicine will exact as a condition to graduation in medicine, of all its students who may not have previously matriculated, attendance upon a graded course of lectures extending over three years. And be it further

Resolved, That our position upon the question of Medical Education does not in the least abate or compromise our objection to what we regard as the attempted enactment of unjust, inefficient and class Medical Legislation, and that this Faculty favors an Examining Board as the fair and rational solution of the problem of Medical Legislation and Medical Education as well.

MARINE-HOSPITAL SERVICE.—A board of surgeons for the examination of candidates for admission into the Marine-Hospital Service will be convened at the United States Marine-Hospital, St. Louis, Mo., October 12, 1891.

Candidates for examination should make application to the Surgeon-General U. S. Marine-Hospital Service, Washington, D. C., as early as practicable, and should enclose testimonials from at least two reputable citizens, preferably physicians, as to their professional and moral char-

acter. No person will be considered eligible for examination, whose age is less than 21, or more than 30 years, or who suffers from any physical defect which would be liable to impair his efficiency or incapacitate him from duty. The candidate must be a graduate of a medical college of good standing, as evidence of which his diploma should be submitted to the board.

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

The impression has for some time been prevalent, that the various private hospitals in the city have been rather too much given to the practice of transferring dying patients to Bellevue Hospital, with a view to keeping down their own death-rate to as low a point as possible, without regard to the bad showing that the records of Bellevue would consequently make. A case in point was published in the newspapers last spring, where an old negro was found lying in the street in an unconscious condition on the lower part of University Place. An ambulance was summoned from St. Vincent's Hospital, which was quite near at hand; but the ambulance surgeon, after examining the man, and finding him to be in a dying condition, took him to Bellevue Hospital, more than a mile and a half distant, instead of to his own hospital.

In commenting on this case, the warden of Bellevue remarked that it was only one out of many instances of inhumanity on the part of the private hospitals for the purpose of keeping down their death-rates. It was the plain duty of the ambulance surgeon, he said, to take the patient to the nearest hospital, and although he was very likely past medical aid, the long ride on the rough pavement to Bellevue certainly did not improve his chances of living. "We are powerless," continued the warden, "because most of the hospitals are classed as private, although they receive money from the city. These hospitals unload everything at Bellevue that looks like death, and the death-rate here makes it look like a slaughter house. After dark, every night, there is a string of ambulances from all the hospitals in town passing through the gates of Bellevue, carrying dying patients. These have been treated at the hospitals until there was no chance left of curing the diseases from which they were suffering, and then the order was given to take them to the dead-house—meaning Bellevue. The doctors at the other hospitals laugh at us. Bellevue is a charity hospital belonging to the city, and we have to take all patients who are unable to pay their board."

If, however, we are to believe the report of a committee appointed by the Grand Jury to examine the condition of the ambulance service in the city and to make recommendations for improving its efficiency, which has just been made to the Court of General Sessions, it is not

true that the private hospitals are in the habit of transferring patients to Bellevue for the purpose of diminishing their death-rates. Such transfers as are made, the committee is satisfied, are proper and necessary. It is certainly to be hoped that this is really the case. At all events, this report, which has been prepared by four gentlemen of intelligence and position, contains much that is interesting and valuable.

In regard to the private hospitals which have an ambulance department, they state that they found the ambulance equipment and service such as called for approval. The ambulance surgeons are all graduates in medicine and no one is detailed for this service until after he has had six months' active duty in the hospital wards. These private hospitals are the New York Hospital, the Chambers Street Branch of the New York, the Roosevelt, St. Vincent's, the Presbyterian and the Manhattan, and they have altogether twelve ambulances. During the year 1890 St. Vincent's had 1,930 ambulance calls; the Manhattan, 567; the Presbyterian, 1,202; the Roosevelt, 1,530; the New York, 1,321; and the Chambers Street, 2,678. The public hospitals with ambulance service are Bellevue, its down-town branch, the Gouverneur, and its up-town branch, the Harlem; and they maintain ten ambulances. During the year 1890 Bellevue Hospital had 4,246 ambulance calls; the Gouverneur, 2,374; and the Harlem, 1,228.

In its report the committee urges the Commissioner of Charities and Correction to establish as promptly as possible a hospital at Fordham, in the portion of the city which was annexed from Westchester County, which has for some time been in contemplation, as it is highly desirable that the districts beyond the Harlem River should be thus provided. It also recommends the early establishment of a hospital, with ambulance service, on the west side of the city, at some point about midway between the Roosevelt Hospital, at 59th Street, and the Manhattan, at 131st Street. There was formerly a public reception hospital at 99th Street, but this was given up some time ago, and the population is increasing very rapidly in this quarter.

In criticising the present faulty system of sending calls for ambulances, the committee does not hesitate to pronounce it positively discreditable that the city is still without a comprehensive system of signal-boxes or stations distributed through the streets in large numbers so that an ambulance can be summoned with the smallest possible delay. "While we find very much to commend regarding the response by all hospitals to ambulance calls upon them," says the report, "we are compelled to criticise very generally the present notification to the hospitals of the necessity for an ambulance at a location where some one may be suffering." Consequently, the committee urges upon the Police Commissioners the importance of at once selecting the most approved and perfect system available for rapid communication with station houses both for ambulance service and for police purposes; and it also asks the Board of Estimate and Apportionment to at once appropriate the money required for this object. In conclusion, it expresses the feeling that the cable roads which are now being laid in many of the principal thoroughfares of the city will be like

to cause an unusually large number of street accidents, especially during the first year that they are in use; and on this account particularly the committee feel that it is highly important that the various recommendations embodied in their report should receive the prompt attention of the proper authorities.

It having been very gratuitously announced by one of the morning papers that Dr. Louis A. Sayre had been obliged on account of ill health to resign his position as Professor of Orthopædic Surgery in Bellevue Hospital Medical College (which he has held ever since the school was founded), and also to retire from practice, the doctor has been obliged to come out in a letter in which he states that neither of these assertions are true, and that while he was confined to the house for a number of months by a very severe attack of rheumatism, he is now sufficiently well to attend to practice and to drive in the Park every fair day. Long indeed may the illustrious and noble-hearted surgeon be spared to the profession and to the city which his honored name has so highly adorned!

Miss Waterbury, a wealthy maiden lady who recently died in Brooklyn, has set an example worthy of emulation by leaving among her bequests the sum of \$5,000 to her old and faithful family physician, and \$3,000 to his daughter.

There has just sailed from this port, with a fair American bride, a real Egyptian Pasha, who is at the same time an English physician of distinction. His name is Crookshank, and while yet but a medical student he served with honor in the medical corps of the German army during the Franco-Prussian war. Later he was a surgeon in the Turko-Russian and Servian wars, and in 1883, when the cholera was raging in Egypt he went to Cairo, where his eminent services attracted the personal attention of the Khedive, who made him a Pasha and appointed him Director-General of Egyptian prisons, a position which he still holds.

P. B. P.

Editor Jour. Am. Med. Assoc'n:—The college announcements of this summer prove that the discussions in past years regarding the improvement of medical education have had considerable effect. The usual directions in which changes for the better are made are in requiring more exact proofs of a good preliminary education, and in increasing the number of courses of college study. There is yet another simple method of securing increased efficiency in the graduates by adding one or two years to the minimum age for graduation. It would not be much of a hardship if it were the rule that the degree of M.D. should not be conferred on a student less than twenty-three years old. Most students are of this age when they graduate. This age is early enough to undertake the responsible duties of a medical practitioner, and the desiderated maturity of intellect, and preparatory literary education might be more certainly attained if students should not be allowed to begin a career of serious investigation when they are mere boys.

MARY A. WHERY, M.D.

26 Madison St., Ft. Wayne, Ind.

Premature Rupture of Membranes not Followed by Miscarriage.

Editor Jour. Am. Med. Assoc'n:—I have just read Dr. Johnson's article in THE JOURNAL, on "Premature Rupture of Membranes not Followed by Miscarriage," and would be glad to report two similar cases—not for the purpose of reporting them only, but to offer a different diagnosis, inasmuch as I think his diagnosis is misleading to the younger members of the profession. My first case, a multipara, white, aged 30 years, pregnancy advanced to the sixth month, had a flow of quite a quantity of fluid which I at the time supposed was amniotic, but the case went on to term without any further difficulty, and I concluded that I was wrong. Shortly after I met with another case, also a multipara, white, aged 28 years; pregnancy advanced to the seventh month. Here again was a large flow of fluid, resembling amniotic fluid, but nothing further developed, and the woman went on to term and was delivered of a healthy child.

Here, now, are two cases which the young practitioner might consider as premature rupture of the membranes, but in reality were nothing more than hydorrhoëa.

For a discussion of the subject I would refer the reader to Cyclopædia of Obstetrics and Gynecology. By Charpentier. Vol. II, page 218. Also to the valuable works of Lusk and Playfair.

S. P. DEAHOFÉ, M.D.

Mineral Point, Wis., August 17, 1891.

BOOK REVIEWS.

THE PATHOLOGY, DIAGNOSIS AND TREATMENT OF INTRA-CRANIAL GROWTHS. By PHILIP COOMBS KNAPP, A.M., M.D. Boston: Rockwell & Churchill. 1891. 8vo., cloth, pp. 161.

This book is the essay to which was awarded the Fiske Fund prize at the annual meeting of the Rhode Island Medical Society, held at Providence, June 12, 1890.

The essay is based on the records of forty cases with necropsies, thirty-eight of which were patients at the Boston City Hospital.

There is a chapter each on Ætiology, Pathological Anatomy, General Symptomatology, Special Symptomatology, Diagnosis, Course Duration and Prognosis, and Treatment. There is a table of cases of removal of intra-cranial growths, and a list of references.

Examination of the book shows that as a record and commentary on the forty cases, it fulfils its mission, but it can by no means take the place of a systematic treatise on the subject. It cannot be favorably mentioned in comparison with Bramwell on Intra-Cranial Tumors, on account of its lack of system, and of thoroughness. It fails to mention the records of many accessible hospital reports, and the following statement is made on page 25: "In America they" (*parasitic cysts*) "are rare, and the hos-

pital records show very few cases of hydatid cysts anywhere in the body, and none in the brain." The author will find an "American" case of hydatids of the brain in the report of the Marine-Hospital Service for 1883, p. 220, and another in the same series of reports for the year 1888, p. 324. There are recorded in these reports 571,528 cases of disease, from 1873 up to 1890, and the total deaths recorded were 7,367, and the number of necropsies 1881 to 1890 were 1,913—out of this total the reports show but seventeen cases of intra-cranial tumors; six of the seventeen were gummata. These figures are given to indicate a source of information too frequently overlooked by medical statisticians, and to correct an error of the author. The reports of several American hospitals for the insane might also be consulted with advantage.

We commend the book, as a generally careful piece of work, and as giving in small space a fair review of the subject, and as such it will be welcome to the table of every neurologist and general surgeon.

A MANUAL OF MODERN SURGERY. AN EXPOSITION OF THE ACCEPTED DOCTRINES AND APPROVED OPERATIVE PROCEDURES OF THE PRESENT TIME, for the Use of Students and Practitioners. By JOHN B. ROBERTS, A.M., M.D., Professor of Surgery in the Woman's Medical College of Pennsylvania; Professor of Anatomy and Surgery in the Philadelphia Polyclinic; Lecturer in Anatomy in the University of Pennsylvania. With 501 Illustrations. Philadelphia: Lea Brothers & Co. 1890.

It is difficult to conceive in what manner more of practical instruction could be conveyed in the brief space of 770 pages, than is presented in this practical manual by Professor Roberts. A review of Part First, which is devoted to general surgery and pathology and the principles of surgery, clearly indicates that upon the essential points with reference to inflammatory processes, diseases of the blood, the modes of repair and the treatment of wounds, as well as in the details of operative surgery, the latest views upon these important subjects are well represented. Part Second of the volume contains some fifteen chapters which treat upon the surgery of special structures. The one upon diseases and injuries of the brain and spinal cord will well repay repeated perusal. So also of the one upon surgical diseases of the abdomen and pelvis. The proper methods of treating injuries of every sort are well described. By text and by ample illustrations selected from a variety of authors, as well as from original drawings, the methods of operating are clearly set forth, and its suggestions will be helpful both to students and practitioners. Much of value will be found relating to all the special departments of surgery, so that not only to students and to

general practitioners, but as well to specialists, this work commends itself.

As a contribution to American medical literature it does credit to its author, while to the American profession, with which Dr. Roberts stands so pleasantly related, it proffers another valuable American contribution.

In its publication it bears evidence of the same good taste and liberal expenditure which has through long years been characteristic of the house from which it emanates.

TEXT-BOOK OF HYGIENE. A Comprehensive Treatise on the Principles and Practice of Preventive Medicine from an American Standpoint. By GEORGE H. ROHÉ, M.D., Professor of Obstetrics and Hygiene in the College of Physicians and Surgeons, Baltimore; Director of the Maryland Maternité; Member of American Public Health Association, etc. Second Edition, thoroughly Revised and largely Rewritten, with many Illustrations and valuable Tables. Philadelphia and London: F. A. Davis, Publishers. 1890.

The appreciation of this work is best shown by the fact that a second edition is so soon in demand. An opportunity is thus afforded for Professor Rohé to incorporate much valuable matter which has been gathered from the fields of preventive medicine, since the issue of the first edition. The second edition bears evidence of a very thorough revision. Over a hundred pages have been added to the text.

The first five chapters are devoted to the subjects of air, water, food, soil and sewage. The construction of houses and hospitals are next considered. Then follow chapters upon industrial, military and camp, naval and prison hygiene. Exercise and training are well considered. Bathing and clothing next receive attention. The methods for disposal of the dead form an important chapter. Later the germ theory of disease is discussed, and chapters follow upon contagion and infection. A valuable article upon quarantine, from the pen of Walter Wyman, M.D., Surgeon U. S. Marine-Hospital Service, concludes the volume.

Preventive medicine, more than at any other period in the world's history, now commands the thought and study of the medical profession.

This work by Professor Rohé is a valuable contribution to the literature upon this subject, and as an American work it is all the more acceptable to those of us who have a special pride in the development of American literature. The volume will be found exceedingly instructive, and will commend itself to a large class of persons who are interested in sanitary science, but who are not members of the medical profession. To such, as well as to medical men, we commend the work.

A MANUAL OF THE PRACTICE OF MEDICINE. By FREDERICK TAYLOR, M.D., F.R.C.P. Physician to, and Lecturer on Medicine at Guy's Hospital; Physician to the Evelina Hospital for sick children; Examiner in Materia Medica and Pharmaceutical Chemistry at the University of London. With Illustrations. Philadelphia: P. Blakiston, Son & Co., 1012 Walnut St. 1890.

This valuable practical work of eight hundred pages from the pen of the well-known English author, Professor Taylor, is well worthy of a place in the libraries of American Practitioners. It deals concisely with the nature, course and treatment of diseases. Specific infectious diseases are very fully described, and his methods of treatment are judicious.

He considers the diseases of the nervous system in general, and specifically in a manner helpful to the practitioner; his descriptions being lucid and yet concise, and their treatments such as promise the best results. The diseases of the digestive organs, those of respiration, and of the circulatory system are carefully described, and the directions for treatment will be found especially suggestive to those whose means of library references are limited. The leading varieties of skin disease are well considered and their treatment indicated. His section on urinary diseases will repay a careful reading. By this reproduction of an English work upon Medical Practice the publishers have conferred a benefit upon the American medical profession. Price \$4.

A TREATISE ON MASSAGE. Theoretical and Practical; Its History, Mode of Application and Effects. Indications and Contra-Indications, with results of over fifteen hundred cases, by DOUGLAS GRAHAM, M.D. Second edition. Revised and enlarged. New York: J. H. Vail & Co.

In this revised edition of the author's work,—the first having appeared in 1874—is shown the same enthusiasm which characterized the first one. This serves a two-fold purpose. It inspires patients, for a time at least, with hopefulness, and stimulates the profession to further investigate its range and value as a therapeutic agent, both of which remain yet to be firmly established. Perhaps the author will have less occasion to complain of the want of familiarity of the medical profession with the subject of massage now than at the time his book first appeared.

Although the manipulations which now are known as massage were practiced, and with benefit, even prior to the Christian era, it is probable that at no time has the subject received more, if as much, attention than in the last decade. The comfort given by judicious practice of the art is not an inconsiderable matter in functional dis-

turbances. If it can be established that it will, in other cases, do one-half of what is claimed for it by its enthusiastic advocates, it should find a more prominent and a lasting place among our remedial measures.

In addition to the physical aspect of the subject, in its practical work, it has become apparent that there is also a moral one. It is not necessary to condemn a worthy measure because it may be perverted. It is, however, to be regretted that, as massage is now being tested on its merits, and from a scientific standpoint, any occasion should have arisen that so-called massage establishments, in our cities, should have made it necessary to place them under police surveillance, in the interest of public morality.

This book, in the eighteen chapters into which it is divided, covers the supposed range of the usefulness of the art, and is a fair exponent of what may be regarded as an enthusiast's conviction, based upon experience—his own and others—in a great variety of cases. The results are, at least, suggestive, and the book is not devoid of interest, although it may not, always, convince. It may be but a typographical error that fixes the period of the war of the rebellion in the United States as being "from 1860 to 1864."

MISCELLANY.

A HINT.—Last week Messrs. John S. Christian and Frederick Reistorf, druggists of this city, were each fined \$100 for practicing medicine without a license.

ERRATA.—IN THE JOURNAL of August 8, the article on the National Temperance Hospital was wrongly credited to Dr. J. Davis, instead of Dr. Chas. Gilbert Davis of Chicago.

MISSISSIPPI VALLEY MEDICAL ASSOCIATION.—This Association will hold its seventeenth annual session at the Pickwick Theatre, Washington and Jefferson aves., St. Louis, October 14, 15 and 16. A full programme of interesting papers has been prepared and provision has been made for the fullest, freest and most complete discussion of the same. Representative men from various sections of the country have been invited to open the discussions. The local profession of St. Louis is a unit to the end that every visiting physician shall be received and welcomed in a regular warm hearted, St. Louis style.

The same qualifications for membership in this Association are requisite as for the American Medical Association, the former being subordinate to the latter. If eligible, you and your friends, together with your wives and families, are most cordially invited to visit St. Louis and enter into the scientific work and the social pleasures as you may desire.

I. N. LOVE, Chairman Committee Arrangements.

AMERICAN GYNECOLOGICAL SOCIETY.—Programme of the Sixteenth Annual Meeting, to be held in the lecture room of the Columbian University, corner of 15th and H streets, Washington, D. C., on September 22, 23, and 24, 1891. Physicians are cordially invited to be present.

First Day—Tuesday, September 22.

Morning session at 9.30 o'clock. Roll-call, reception of guests, etc. Address of Welcome. By Dr. Joseph Taber Johnson, of Washington.

1. The Advantages of Mixed Anæsthesia in Gynecological Surgery. By Dr. John R. Reeve, of Dayton, Ohio.

2. Concealed Accidental Hæmorrhage During Labor. By Dr. Henry C. Coe, of New York.

3. Diffuse Adenoma of the Uterine Body. By Dr. James R. Chadwick, of Boston.

4. The Influence of Season on Recurrent Pelvic Inflammations. By Dr. Frank P. Foster, of New York.

5. The Therapeutic Aspect of Some Ovarian Disorders. By Dr. Edward W. Jenks, of Detroit.

Adjournment at 1 P.M. Afternoon Session at 2.30 o'clock.

6. Insanity Following Laparotomy. By Dr. J. M. Baldy, of Philadelphia.

7. Vaginal Hysterectomy by *Morcellement*; Technique and Indications for Operation. By Dr. Samuel Pozzi, of Paris, France.

8. A Clinical Study of Primary Carcinomatous and Sarcomatous Neoplasms between the Layers of the Broad Ligament, with Report of Cases. By Dr. Joseph E. Janvrin, of New York.

9. The Present and Improving Status of Cæsarian Surgery. By Dr. Robert P. Harris, of Philadelphia.

10. Unique Case of Multiple Neuro-lipomata following Laparotomy. By Dr. H. Marion Sims, of New York.

Second Day—Wednesday, September 23.

Morning Session at 9.30 o'clock.

11. President's Address.

12. The Treatment of Cancer of the Cervix Uteri by High Amputation; Second Series of Cases, with Additional Report on the First Series. By Dr. William H. Baker, of Boston.

13. The Advantages of Delivery in the Left Lateral Posture. By Dr. Henry J. Garrigues, of New York.

14. The influence of Imperfect Development as a Cause of Uterine Disease. By Dr. W. Gill Wylie, of New York.

15. The Technique of Vaginal Fixation of the Stump in Abdominal Hysterectomy. By Dr. Henry T. Byford, of Chicago.

16. Can We Avoid Mural Abscesses and Ventral Herniæ after Laparotomy? By Dr. Horace T. Hanks, of New York.

Adjournment at 1 P.M. Afternoon Session at 2.30 o'clock.

17. Some Clinical Testimony as to the Ultimate Results of Removal of the Uterine Appendages. By Dr. Thaddeus A. Reamy, of Cincinnati.

18. Indications for Abdominal Section in the Treatment of Puerperal Pelvic Inflammations. By Dr. R. B. Maury, Memphis, Tenn.

19. A Study Relative to the Functions of the Reproductive Organs in American Indian Women. By Dr. Andrew F. Currier, of New York.

20. The Immediate Closure of Laceration of the Cervix. By Dr. Cornelius Kollock, of Cheraw, S. C.

21. The Conservative Treatment of Pelvic Tumors and Diseases. By Dr. Eugene Gehrung, of St. Louis.

22. The Anatomical Relations of the Lacerated Perineum to the Mechanics of its Causation. By Dr. Edward Reynolds, of Boston.

Business meeting, with closed doors, at 8 P.M.

Third Day, Thursday, September 24th.

Morning session at 9.30 o'clock.

23. In Memoriam,—Dr. Fordyce Barker, by Dr. James R. Chadwick, of Boston.

24. Ureteritis in the Female, by Dr. Matthew D. Mann, of Buffalo.

25. The Surgical Treatment of Retroversion and Pro-lapse of the Uterus, by Dr. Paul F. Mundé, of New York.

26. A Paper, by Dr. Theophilus Parvin, of Philadelphia.

27. Series of One Hundred Laparotomies; My Mistakes and Failures, by Dr. A. Palmer Dudley, of New York.

Adjournment at 1 P.M.

Afternoon session at 2.30 o'clock.

28. Laparotomy in Trendelenburg's Posture, with Exhibition of a New Operating-Table, by Dr. Clement Cleveland, of New York.

29. The Electrical Treatment of Uterine Fibroids in England, by Dr. George Keith, of Brooklyn.

30. Diabetes Mellitus Gravidarum, by Dr. Henry D. Fry, of Washington.

31. A Successful Porro Operation, by Dr. R. Stansbury Sutton, of Pittsburgh, Penn.

32. An Argument against the Stem pessary, or so-called Drain-tube, by Dr. Egbert H. Grandin, of New York.

There will be a lunch at the Arlington Hotel each day after the morning session, for the Fellows and invited guests.

Officers for 1891.—President, A. Reeves Jackson, Chicago. Vice-Presidents, Joseph Taber Johnson, Washington, William H. Baker, Boston. Secretary, Henry C. Coe, New York. Treasurer, Matthew D. Mann, Buffalo.

Other Members of the Council.—William M. Polk, New York; H. P. C. Wilson, Baltimore; Francis H. Davenport, Boston; E. C. Dudley, Chicago.

The Hotel Arlington will make a deduction to Fellows and Guests of the Society.

HYDRASTIS CANADENSIS FOR NIGHT-SWEATS.—Cruse has used the fluid extract of hydrastis canadensis with very good results in the night-sweats of phthisis. He gives it in doses of thirty minims, and often finds that the dose does not have to be repeated for some time.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from August 8, 1891, to August 14, 1891.

Asst. Surgeon John J. Cochran, U. S. A., died at St. Luke's Hospital, New York City, August 5, 1891.
Major Alfred C. Girard, Surgeon U. S. A., relieved from duty at Ft. Niagara, New York, and ordered to Ft. Sheridan, Ill., for duty.
Capt. John O. Skinner, Asst. Surgeon, assigned to duty at Ft. Clark, Texas.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending August 15, 1891.

P. A. Surgeon J. Baker, detached from U. S. S. "Palos," and authorized to delay reporting in the United States for six months.
P. A. Surgeon J. S. Sayre, detached from the U. S. S. "Ranger," and ordered to the U. S. S. "Palos."
P. A. Surgeon V. C. B. Means, ordered to the New York Naval Hospital, September 1.

Official List of Changes of Stations and Duties of Medical Officers of the U. S. Marine-Hospital Service, for the Three Weeks Ending August 8, 1891.

Surgeon George Purviance, detailed as chairman, Board of Examiners. August 8, 1891.
Surgeon H. W. Sawtelle, to proceed to Portland, Me., for special duty. August 3, 1891.
Surgeon John Godfrey, to represent the Service at Seventh International Congress of Hygiene and Demography. July 25, 1891. Detailed as member Board of Examiners. August 8, 1891.
Surgeon Fairfax Irwin, detailed as recorder Board of Examiners. August 8, 1891.
Surgeon F. W. Mead, granted leave of absence for thirty days. July 30, 1891.
P. A. Surgeon H. R. Carter, granted leave of absence for thirty days. August 8, 1891.
P. A. Surgeon D. Carmichael, granted leave of absence for thirty days. August 3, 1891.
P. A. Surgeon W. J. Pettus, to proceed to Wilmington, N. C., for temporary duty. July 31, 1891.
Asst. Surgeon J. C. Perry, granted leave of absence for twenty-seven days. July 28, 1891.

The Journal of the American Medical Association

VOL. XVII.

CHICAGO, AUGUST 29, 1891.

No. 9.

ORIGINAL ARTICLES.

SIMPLE METHODS OF SEWAGE DISPOSAL.

Read in the Section of State Medicine, at the Forty-second Annual Meeting of the American Medical Association, Washington, D. C., May 5, 1891.

BY C. W. CHANCELLOR, M.D.,
SECRETARY STATE BOARD OF HEALTH, BALTIMORE, MD.

Among the many problems engaging the attention of sanitary engineers, that which embraces the removal or disposal of household sewage, is perhaps the most important. With the advance of natural sciences, the principles which are recognized as governing health and disease have been gradually developed, until we are now faced with the fact that if we would be free from health diseases, it is necessary to remove from our midst those elements which are either their direct cause or agents of transmission.

The question resolves itself into disposing of such matters in a manner best suited to the conditions and locality in which they are produced, having regard:

1. To the sanitary efficiency of the method employed.
2. To the economical attainment of the result aimed at; and
3. To the method of disposal affording some return for the means expended.

The conclusions which naturally follow the foregoing propositions, and which, from a sanitary standpoint, dominate the whole question, may be summed up as follows:

- a. That wherever there is excretal refuse to be disposed of, it should be so treated as to remove or separate the solid from the liquid parts.
- b. That the impurities conveyed by the liquid parts of sewage, which are more readily oxidized, are insignificant as compared with those of the solid parts.
- c. That the solid parts of excretal sewage should never under any circumstances be allowed to enter a water-way; and if the fluid parts can be subjected to some artificial process of purification, and subsequently passed through the soil by subsurface irrigation, so much the better.

These are fundamental axioms which require

no discussion; but it must be admitted that, thus far, serious difficulties have environed the practical application of these principles to the question of sewage disposal.

Apart from the question of health, the practice of discharging crude sewage into water-courses has its attendant evils. The solid matters will gravitate to the banks and bed of the stream, which not only obstructs natural drainage, but is liable to decompose and become offensive as the water falls, and exposes it to the action of the sun and air. Again, the more finely diffused solid particles are exceedingly hurtful to fish, choking up their gills and suffocating them. Moreover, fish breathe by means of the free oxygen which is contained in the water in which they natate, and this element being deprived of its oxygen by the admixture with sewage, the fish must necessarily die.

This fact alone, viewed in the light of political economy, should restrict the amount of sewage poured into any limited area of water; for however admissible *fresh* sewage may be as food for fish, it soon becomes stale, and in this condition acts as a poison which will eventually destroy the fish and oysters of any water area into which it is discharged.

Again, when sewage passes into a putrefactive state, the gases that are generated either in sewer pipes or water-courses, are capable of producing certain malignant diseases; but whether the illness is to be regarded as the direct effect of inhaling the mixed chemical gases, or as an expression of the consequences of inspiring a micro-organism which is reproduced in the human body, is not known to medical men—who are, however, perfectly familiar with the illness.

One of the greatest difficulties of adequately dealing with this sewage question, lies in the enormous bulk to be operated upon—equal to about 5 gallons of water to every 3 ozs. of fæcal matter—and it is therefore reasonable to suppose that, could some simple mechanical appliance be devised by which the liquid could be drawn off and separated from the solid parts, it would greatly assist in the efficient treatment of excretal refuse. The fluid part need not necessarily be passed directly into a water-course; it could be first distributed by subsurface irrigation over a sufficient

area of land, for which it would serve as a useful manure, and by which it would be effectively filtered and still further purified. The employment of such a method is the more to be recommended because, when a process of separation only has been employed, as contradistinct from a process of precipitation with chemicals, the effluent is richer in organic substances available for the nutrition of plant life, and the solid matters being excluded, the pores of the soil will not become clogged.

As to the manurial value of the solid matters retained, that must be judged rather by the practical results of the agriculturist than by the presumed theoretical values based on analytical data. The percentage of combined nitrogen, however, in this material is remarkably constant, and the phosphoric acid which it contains is also an important ingredient in an agricultural point of view.

Fæcal matter has been termed "the natural food of the soil," as it returns to the soil those elements which are taken from it by the growth of vegetable products necessary for the proper nutrition of man. By treating excrementitious matters by a process of separation, moreover, what is now a nuisance to cities and towns may be made a source of profit to the country generally, especially to the agriculturist, who would find in the solid matters a valuable guano—superior to most manures in the market—produced at his own door.

"The most fertilizing and effective manure," says Victor Hugo, "is human manure; but what is done with this golden dung? It is swept into the gulf! We send, at great expense, fleets of ships to collect at the Southern Pole the guano of petrels and penguins, and cast into the sea the incalculable element of wealth which we have under our own hands."¹

If this so-called "golden dung" has the value that is ordinarily attached to it, private enterprise would surely be rewarded for its collection and utilization, and could well afford to pay a handsome bonus for its preservation. Agriculture, so important a factor in the country's industry and prosperity, has up to this time suffered such heavy losses from this material being "cast into the gulf," that, apart from the question of health, its interests are fully entitled to the serious consideration of political economists and legislative bodies.

It has been asserted that one prime cause of the fall of the Roman Empire was the building of the great sewers of Rome, and the consequent disastrous deflection of what might have been an enormous fertilizing material, into the Tiber, where it went to waste.

The Chinese are said to preserve carefully everything that can be used to enrich the earth for food production, and there seems to be a growing dis-

position, both in Europe and America, to follow their example, by devising measures and making experiments to utilize excretal refuse for enriching the soil; but we must admit that there is still a squandering of this valuable material that may well alarm the political scientist.

It is, undeniably, of the last importance that household sewage, which is now allowed to go to waste with a reckless disregard of both public health and agricultural prosperity, should be utilized in some cheap, cleanly and simple fashion; and surely, the ingenuity of man can be applied in no more useful way than to a proper solution of this important question, which embraces not only the welfare of society, but even the integrity of nations.

Passing by the difficulties which are unmistakably attendant upon the disposal of sewage in large quantities, the question comes up, how is it to be treated, as treated it must be, if the health of the inhabitants of our towns is to be considered? The methods of treatment, other than those involved in the systems by which the whole of the sewage is sent into water-courses—if, indeed, this may be considered a system of treatment at all—and in applying crude sewage for the irrigation of land, are pretty numerous; but numerous as they are, they all come under one or the other of the following classes:

1. Dealing with excretal refuse in a special way, altogether separate from large sewage drains, leaving these to conduct the waste waters of domestic and industrial operations and also the rain or storm waters alone.

2. The precipitating process, by which the solid organic and putrescible portions of the sewage are deposited in a solid form, which may be used as an ordinary manure, passing the liquid portion, in a condition more or less clear, into some stream or river.

3. Keeping the rain or storm water on the surface, or sending it into drains distinct from those conveying sewage, to be discharged into some river or stream; while the crude sewage, in a more concentrated form, is also passed into the water-course, or on the land for irrigation purposes.

4. A combination process of straining, precipitating and filtering, by which the solid part of the excreta is separated from the liquid, as it were, at the fountain head, and retained in a hermetically closed vessel or tank, under a column of water, while the fluid parts, with the ordinary water of the closet, are passed through the meshes of a fine strainer, and then either run into the soil by subsurface irrigation, or filtered through some oxidizing agent, as burnt or spongy iron, to be subsequently discharged on the surface of the ground, or into a water-course.

Under the first of these four classes there are a number of arrangements which, when taken col-

¹ *Les Misérables*, p. 290.

ectively, may be termed the dry system of collection.

The cess-pit and the midden were the first attempts at collecting excreta, not so much, however, for the purpose of profit as with the idea of preventing nuisance. The cess-pit need only be mentioned to be condemned. The ash pit midden, or privy, has its advantages and its difficulties; of the difficulties, the education of the people to use them properly is chief—a difficulty, however, that applies quite as much to water-closets as to middens.

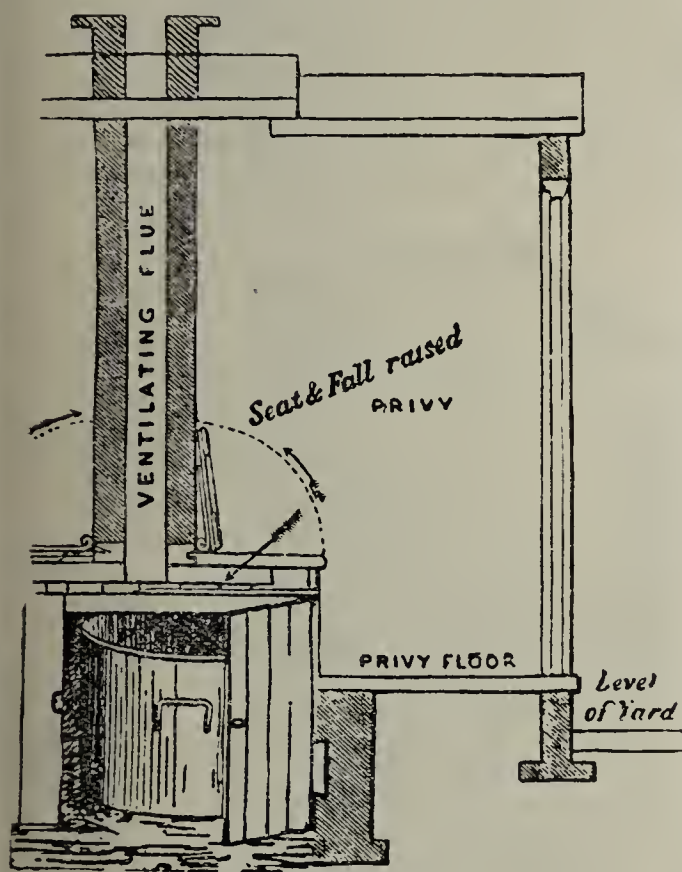


FIGURE 1.

The general principle of the ash pit midden or privy system is illustrated in Figure 1. It consists of a common privy, with a small covered ash pit, from the top of which, a ventilating shaft is taken to the roof of the house to which it is attached. The floor of the ash pit is of glazed earthenware, absolutely water-tight. The ashes used as an absorbent are emptied into the pit through the privy seat, whenever the closet is used. These pits are cleaned as often as may be necessary. This system is used at Hull, England.

The Manchester method, Figure 2, consists of a common privy, outside the house, constructed with a sunken pit, in which stands a galvanized iron receptacle, placed under the seat of the closet. The floor of the pit is of earthenware, and the ventilation is through the flue as shown in the illustration. The door for removing the receptacle is at the side or back. In the absence of the receptacle, the ash pit can be used. The receptacle is emptied weekly.

The Rochdale method is similar to the Manchester, except that the wooden pail, generally

made from a kerosene barrel, is substituted for iron, and sits immediately beneath the closet seat and on the same level of the floor, instead of below the surface of the ground, which makes removal more difficult. Figure 3 is an illustration of the Rochdale system.

The Goux system consists in lining the inside of the tub with absorbents as charred sea weed or dry earth, rammed in by a central core, so as to give a uniform lining to the tub, thus preventing splashing. This method necessitates the frequent removal of the excreta. The faecal matter is received in the central cavity of the lining.

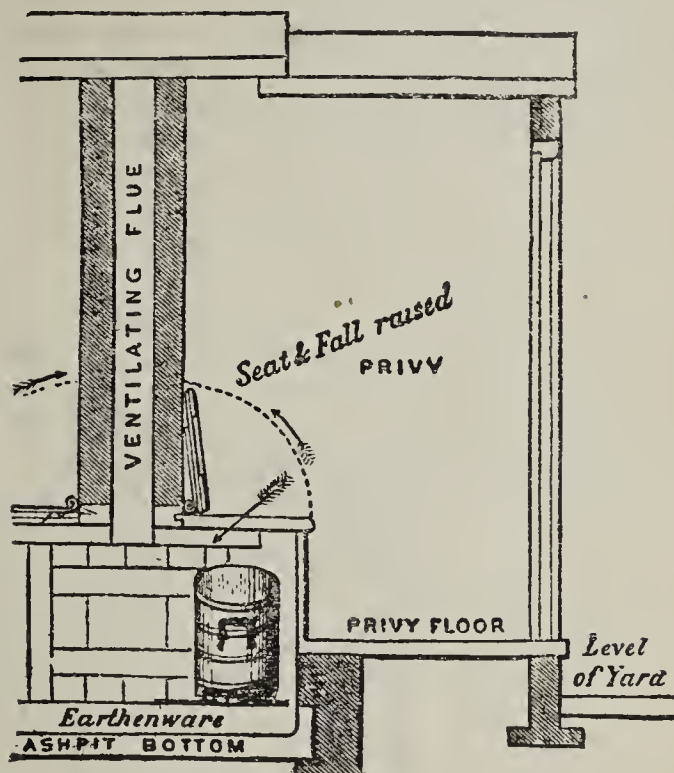


FIGURE 2.

At Birmingham, where the galvanized pails are used to the extent of some 40,000, representing a population of 250,000, the contents are collected weekly. These are emptied into a vat at the place of deposit, and some sulphuric acid added to fix the ammonia.

The object of these several methods is the conversion of the old and dangerous system of privy pits into receptacles calculated to promote health and decency, and keep out from sewers as much of the excremental matter as possible. There is no doubt whatever of the fact that either of these systems is infinitely more healthy and more reasonable in every way than the cesspool, and, personally, I am strongly inclined to think that a dry system of collection in villages and small towns, even if not in larger centres of population, is to be recommended in preference to the usual water-carriage system.

Lastly, we have among the dry systems of collection, Moule's dry earth closet, in which the deodorizing and absorbent power of the earth is applied to the treatment of excreta. This closet is illustrated in Figure 4.

However efficient as a deodorizer and absorbent dry earth may be, there are almost insuperable difficulties attendant upon its use, which have retarded its general introduction, even in country districts. About four and one-half pounds of dry earth per head per day are required to obtain a consolidated and inoffensive compost. A village of 1,000 persons would need, therefore, about two tons of dry earth per day. Moreover, it is a *sine qua non* that no liquids are to be discharged into the closet, so that it is a system which does not provide for liquid excreta; or if the air is very damp, which is the normal condition in certain places, or if the contents get moist in any way, we have, to all intents and purposes, a cesspool without its advantages, or without the special precautions that are commonly taken with regard to cesspools.

purpose of precipitating from the water certain matters which are therein suspended.

The third plan is that by which the great dilution of sewage with water is proposed to be avoided by having two distinct sets of drains, one to convey away the household sewage alone to some water-course, or to be treated by precipitation or subsurface irrigation; the other set of drains to carry off storm and street water. This was first proposed half a century ago by Mr. F. O. Ward, of England, and was subsequently practically carried out by Mr. Menzes, at Eaton, and, more recently, by Col. Geo. E. Waring, at Memphis. There can be no doubt that if the rainfall could be excluded from the sewage proper, a vast step would be gained towards the practicability of usefully applying sewage to the soil, but even then the area of land required

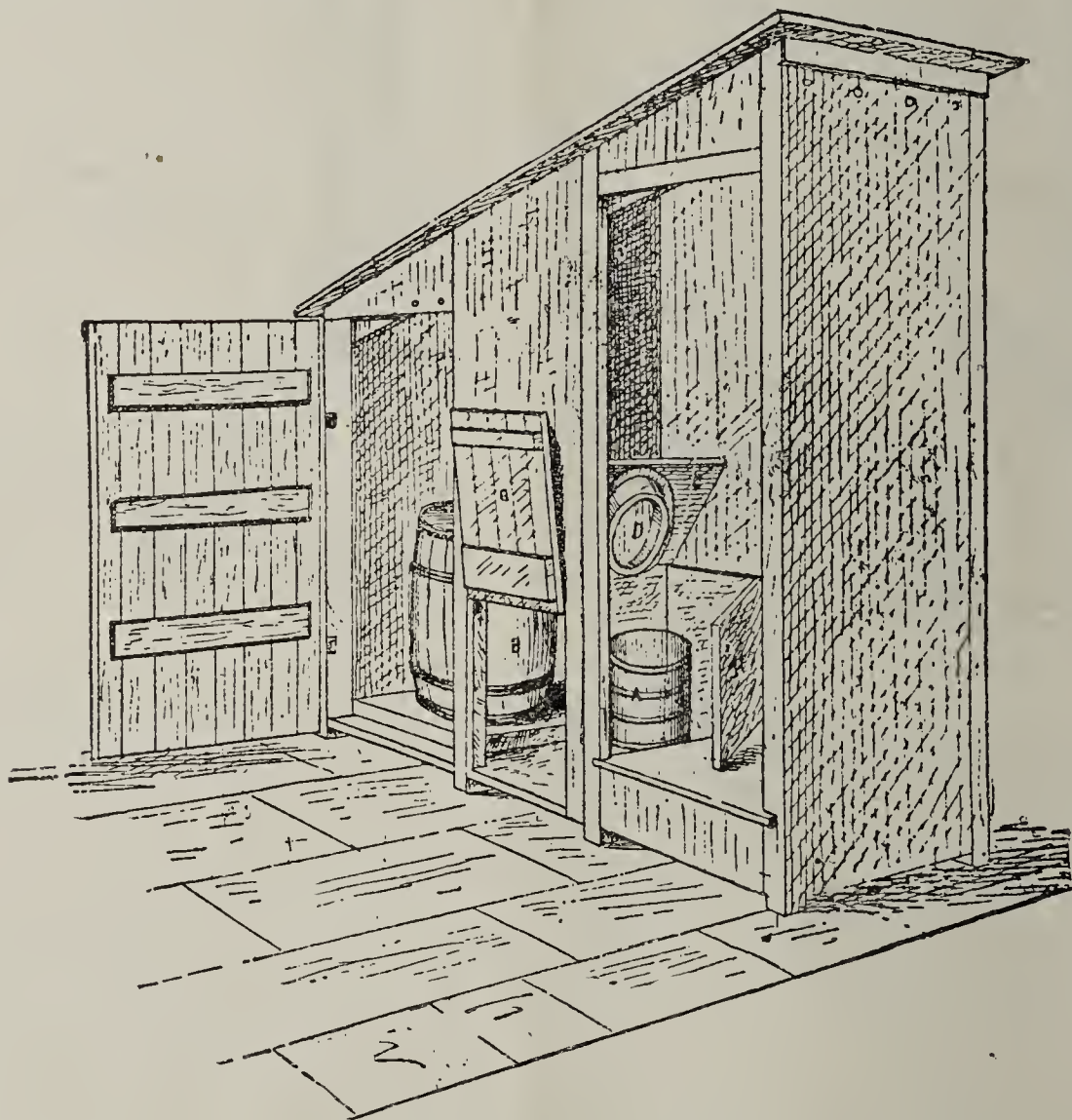


FIGURE 3.—ROCHDALE PAIL CLOSET.

A, excrement pail. *B*, ash tub. *C*, seat cover (raised), *D*, iron collar below seat, reaching slightly into pail when cover is down. *E*, hinged upright of seat. *G*, door admitting from outside to excrement pail.

We come now to consider the precipitating processes. A great number of these have been tried, but the general result seems not to have been satisfactory, since none have thus far been free from a feature which practically condemns the whole of them, viz., the employment of expensive chemicals in large quantities for the

would be so great and the cost of preparation so immense that the suggestion has been considered by high authorities to be hardly practicable. Moreover, it has been pretty well established that the putrefactive decomposition of solid excretal matter in soils gives rise to the production of malarial and parasitic diseases, and that such

lid organic matters, after a time, will form a crust or cake upon and in the interstices of the soil, which gives off offensive and dangerous effluvia. Again, the sub-soil water from broad irrigation is charged with decomposing matters, and Petenkofer is not alone in his opinion that there is no more fruitful source of disease than polluted sub-soil water which is constantly raising its level."

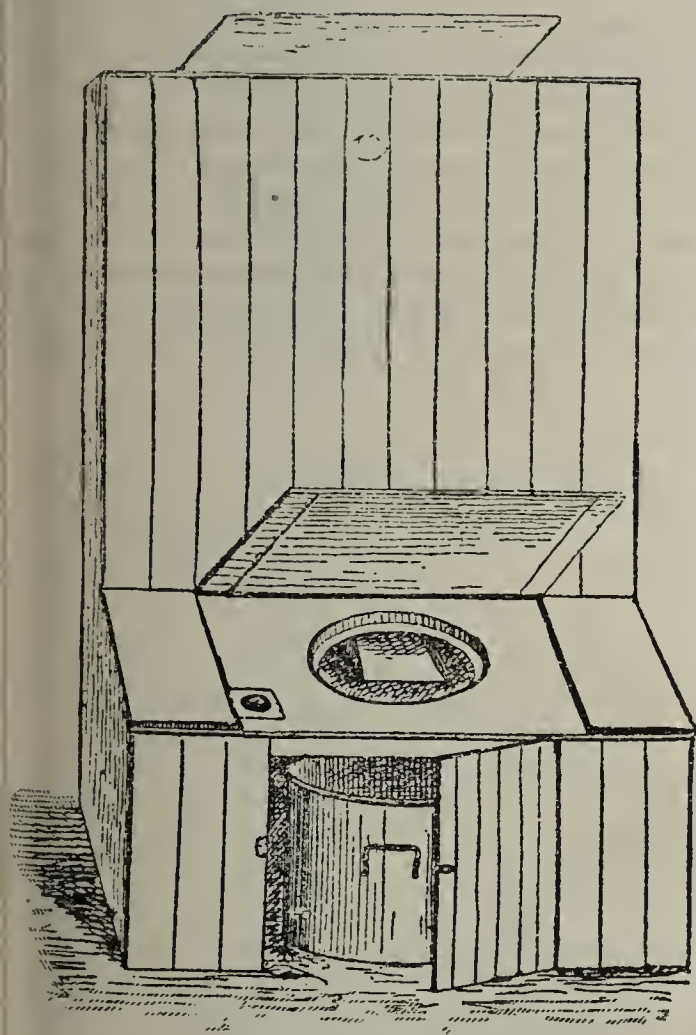


FIGURE 4.—DRY EARTH CLOSET.

The mere fact that the available land near large cities, at least, is insufficient for the disposal of sewage by irrigation, is sufficiently condemnatory of the process as an exclusive means of utilizing sewage. According to M. Lefeldt, one acre of land is required for the excreta of every twenty or thirty persons when applied by broad irrigation; while Mr. Henry Robertson, in England, in a paper on sewage disposal (*Sanitary Record*, 1884), contributed to the Sanitary Institute meeting at Dublin (1884), states that "open porous land with a good free sub-soil drained six feet deep, will deal, per acre, with the sewage of 600 people," but the cost of preparing the land he estimates at from \$4,000 to \$5,000 per acre, so that, practically, it does not much matter which kind of irrigation be used.

The theory of purification by irrigation is that the fluid part of sewage gradually percolates through the land, and is finally carried off by the artificial under drains, while its organic con-

stituents are subjected to oxidation by the agency of microorganisms producing the phenomenon known as "nitrification." The solid parts left in the soil are also attached, and gradually succumb to the influence of hydration and oxidation; but there is a limit to this process, and should the land become overcharged or choked with solid matters, which often occurs on sewage farms, oxidation will not proceed, and an intolerable nuisance ensues.

To prevent this the separation of the solids from the fluids of sewage is essential, and after this the effluent may be disposed of with entire immunity by a process of irrigation; or, in the absence of special objections, the effluent may be discharged into a river or other water area having sufficient volume or flow to oxidize the organic matters which are held in solution. This, however, applies only to sewage, whether mixed with rain water or not, that has been so dealt with by screening, subsidence, precipitation or otherwise, that the solid parts are removed from the liquid parts.

If our boasted scientific knowledge is worth anything, it should enable us to separate the fluid from the solid parts of excretal sewage, and to convert the latter into a good practical manure, while the fluids may be discharged into the soil, or into some water-course, in an innocuous condition.

Some three or four years ago Mr. C. T. Kingzett, the distinguished London chemist, suggested that a small portable apparatus might be supplied to each house, provided with a strainer, whereby the water of crude sewage would be separated from the solid parts; and the receivers could, by a properly organized system, be collected as often as necessary, and a clean one left in the place of the one removed. Such an apparatus, it scarce need be said, should be as simple and as economical as possible, consistently with preventing nuisance or danger to public health; and I claim for a device which I have lately introduced, that it is at once the most simple, the most effective and the most economical that has yet been proposed for the purpose. The method consists of a process and apparatus by which the solid matters of household refuse are effectively separated from the water of crude sewage by mechanical straining, subsidence and precipitation, whereby a large proportion of the suspended matters are detained in a hermetically closed receptacle, which when full can be removed and replaced with an empty one by a common laborer, while the liquid parts are continuously delivered in such a condition of purity, that they may be used to irrigate the soil with advantage, and without any danger of choking its pores; or the effluent from the precipitating tank may be further purified by filtration through iron to such an extent that it can

be discharged into any drain, sewer, cesspit, river or stream with entire immunity. The apparatus is illustrated in the following diagram:

Figure 5 represents a vertical section of the apparatus with all its parts intact, except the filter, which is omitted as it is rarely to be used. *A*, represents the receiving vessel or "receiver;" *B*, the settling or "precipitating tank;" *D*, the outer cylinder of the "strainers;" *E*, the inner perforated "strainer;" *F F*, the soil pipe connected with the strainer *E* above and below; *G*, the collar which connects the soil pipe with the receiver; *H*, the box or holder for the precipitating reagent; *I*, pipe connecting the receiver and precipitating tank for the purpose of drawing down the water to prevent slopping when the receiver *A* is detached at the cellar *G* to be removed. When detached the opening at *G* is closed with a close-fitting cap.

has allowed to pass, sink by gravity to the bottom of the receptacle, while the matters that are more or less dissolved in water find their way along with the supernatant liquid of the sewage through the meshes of the strainer, and from thence by a connecting pipe *D* into the precipitating tank.

The precipitating tank receives the overflow from the "receptacle" which has passed through the strainer. This tank is provided with an automatic device for discharging a certain quantity of chemical precipitants into its contents. The supernatant liquid in the precipitating tank already quite pure, is discharged through the pipe *h*, which, when the effluent is to be disposed of by sub-surface irrigation, is converted into a siphon simply by extending this pipe downward, on the inside of the tank, to a point near the bottom. In this way the flush through

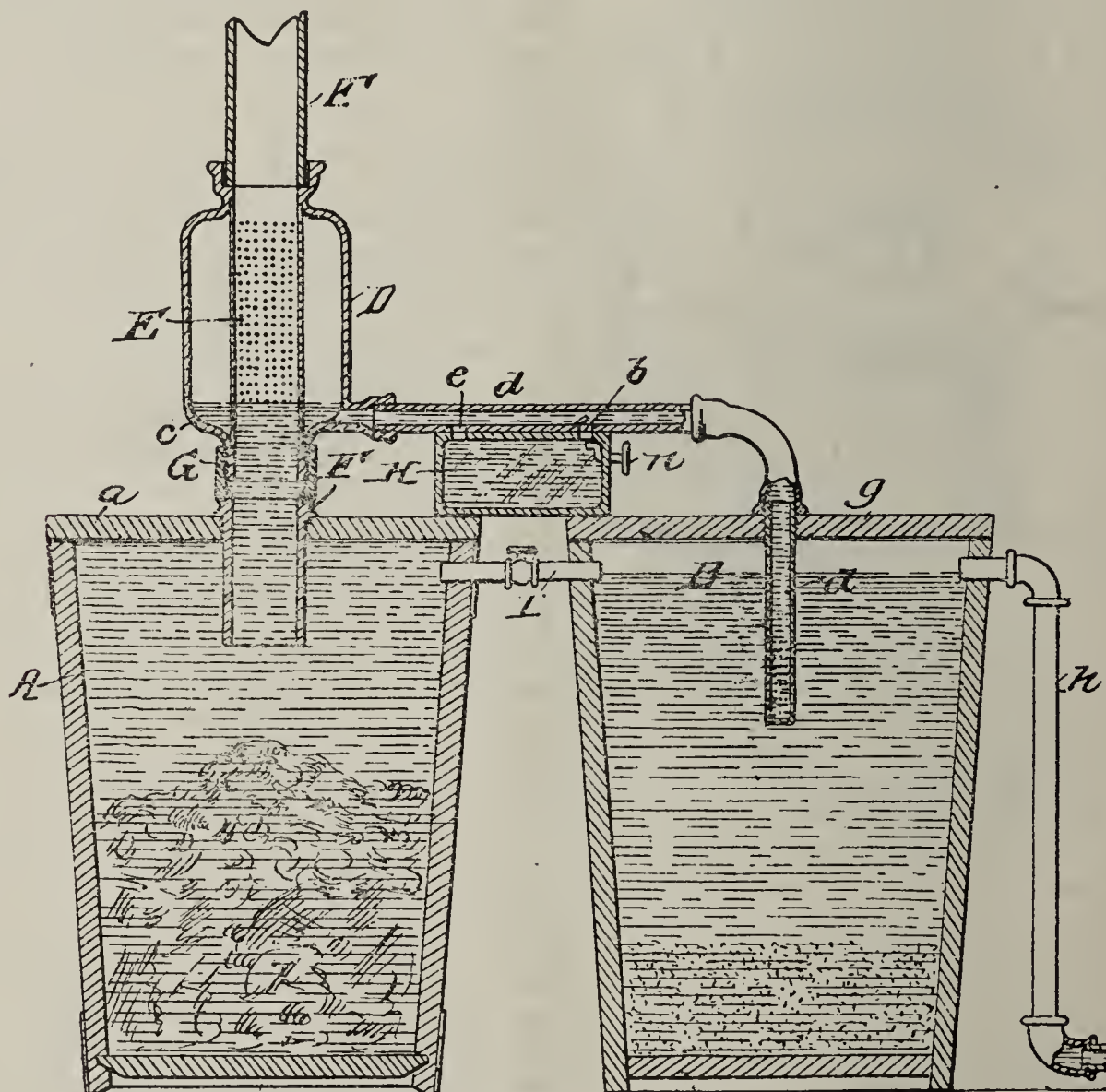


FIGURE 5.

The operation of the apparatus is as follows: All such matters as are generally discharged into the soil pipes of houses are conveyed into the "receptacle," which is removably connected with the soil or drain pipe. The coarser, undissolved matters, such as foreign bodies, ordure, and paper not yet dissolved, which the trap of the soil pipe

the sub-surface irrigation pipes becomes rapid and continuous until the tank is emptied.

The receivers, containing the solid parts excretal matters, are to be collected, when full by a properly organized system, and clean on left in their places. These receivers should be taken directly to the usine or compost factor

here their contents may be worked up, with other substances, it may be, into an innocuous and valuable manure powder ready for immediate application to the soil. The utilization of the solid creta is not, however (and this is a very important matter to public bodies which have to do with the disposal of sewage), confined in any sense to its employment as a manure, or as a source of ammonia and certain salts. It may be pressed, dried, and employed as ordinary fuel for use in boilers or other furnaces. Further, it may be ground up with clay and lime, and converted into brick or cement after the process devised by the late General Scott, of England; or, again, it may be admixed with other materials, such as are ordinarily employed, and converted into a material for use in the construction of sidewalks, foundations of buildings, etc.

INCIPIENT CATARACT; ITS ETIOLOGY, TREATMENT AND PROGNOSIS.

Read in the Section on Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY S. D. RISLEY, A.M., M.D.,

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In a brief paper published in the *University Medical Magazine* for March, 1889, I called attention to the underlying pathological factor in the etiology of *hard cataract*, and entered an urgent plea for the treatment of eyes afflicted with advancing opacity of the lens, before the age of maturity. It was then claimed that by designating these cataracts as "*senile*" the tendency had been introduced to regard them as one of the unavoidable changes incident to the decline of life, and that by this means attention had been drawn away from other and more important factors in their production. It was shown that the hard and inelastic lens of even advanced life was not necessarily an opaque lens, and that approximately normal acuity of vision was quite compatible with old age. That the opaque lens was therefore an extraordinary occurrence to be explained by other causes than senility.

In my early experience, when consulted for relief from commencing cataract, the habit was to acquaint the patient or his friends with the cause of the failing vision. The opinion expressed was to the effect, that for the present nothing could be done to restore the vision—on the contrary, it would probably grow steadily worse, but that though blindness might and probably would ensue in one or both eyes, vision would then be restored by removal of the "*ripe*" cataract. The conjunctival irritation quite habit-

ually present was relieved by mild astringents, advice given regarding the general course of life in its relation to the laws of hygiene, and the patient requested to return occasionally for inspection. Thus the individual and the family were sent away with an abiding solicitude hanging like a cloud over the household, the anxiety—alleviated only by the hope when the worst had fallen—relief would come in the extraction of the mature lens. A more careful study and a steadily widening experience, have convinced me that in a considerable group of these afflicted persons a more hopeful prognosis can be given. In many of them the progressing opacity can be arrested; in still others the rapid increase can be greatly retarded, and failing in this the eye will be in a more favorable condition for operative interference, by virtue of the treatment instituted. For many years, I have with increasing confidence given this opinion to persons applying for relief from their failing sight, consequent upon the blurring lens fibres and the associated conditions, which it is here claimed sustain to each other an etiological relation, and are in large measure amenable to treatment. In the present paper no new facts are brought forward, but at the request of the chairman of the Section it gives me pleasure to once more call attention to the views before expressed, which I do with increased confidence after two years of additional experience, and a more careful study of the data at my command. The clinical picture I have in mind does not include those cases of stationary opacity in the peripheral cortex of the lens, occurring in otherwise normal eyes. Every surgeon must have had frequent opportunity to study these cloud-like bands hanging between the lenticular pole and periphery, usually situated in one of the lower quadrants, or a dense bank of opacity, well down in the periphery, remaining year after year unchanged, and causing the individual no inconvenience. That no misunderstanding may occur as to the claims to be made for the treatment of beginning cataract, I wish to say that I have never seen an established opacity of the lens disappear. In my experience, an opaque spicule once formed has remained or increased. When, under treatment, vision has improved, it has not been from the removal of the opacity in the lens fibres, but from the improved condition of the vitreous body, the retina and choroid. Nor is it intended to include in this study directly, the considerable group of cataracts, which, by common consent, are regarded as "*complicated*" or secondary, *e. g.*, the opacity of the lens which is a part of the closing scene in eyes lost from retinal detachment, inflammatory glaucoma, and irido-choroiditis. No form of eye disease is more familiar to the surgeon than the posterior-capsular opacities *et al.*, which accompany and are dependant upon the more

pronounced forms of intra-ocular disease involving the choroido retinal tract. While these violent forms of disease are not included in this discussion, they are alluded to as pointing in the most unmistakable manner to the important possible relation existing between disease involving the nourishing membranes of the eyeball and the impaired nutrition of the vascular lens. It is probable that we might, with the greatest propriety, regard these complicated cataracts, so-called, as illustrations of a more advanced or violent type of disease, than that here contemplated. There is, however, a very large group of eyes suffering from irritation and chronic inflammatory processes of the retino-choroidal tract which do not present the gross ophthalmoscopic changes which characterize the destructive diseases above referred to, but which may, and doubtless do lead up to them under provocation. Eyes which by virtue of their chronic or subacute pathological state are ripe for more destructive processes, which are lighted up by the onset of some constitutional disturbances, or by some extraordinary exertion or exposure to light or heat. They may or may not be associated with some systemic dyscrasia. Frequently, commencing early in life, they are steadily progressive unless arrested by appropriate treatment, and sooner or later undermine the health of the eyeball, rendering it throughout life especially liable to various forms of acute disease, and are the more or less direct cause of the serious maladies to which the eyes are subjected during and after the middle period of life. To this category belong especially the eyes starting in life with errors of refraction.

The clinical picture presented by this group of *weak eyes* is important to our purpose. Subjectively, we have the familiar picture of asthenopia. They present, however, a characteristic group of objective phenomena which I design to connect with the forms of disease so frequently seen after forty-five years of age, and especially with opacification of the lens. Much has been written to establish the relation of cause and effect between eye strain and the inflammations involving the choroid and retina and the external tunica. A bibliography of this field of observation is no longer necessary, since it has been well established in the practice of ophthalmic surgeons. The woolly choroid or fluffy eye-ground, with the two capillary nerve surfaces; the ragged nerve margins; the ripe-peach choroid; the narrow crescent of choroiditis embracing the temporal margin of the optic nerves, and its steady advance to the large atrophic conus or posterior staphyloma of the distended myopic ball, are well understood, but I am not so sure that we habitually connect with these intra-ocular disturbances the affections of the external tunica. The chronic hyperæmia of the conjunctiva, and

dilated anterior perforating vessels, the swollen and red coruncles, the blepharitis ciliaris, the increased secretion and partial retention of tears, the recurring styes, are frequently but the external expression of the grave disturbances of the circulation of the intra-ocular tunica.

It were cause for surprise if, in the presence of this general disturbance of the nourishing membranes of the eyeball, the vitreous body and crystalline lens, divorced as they are from a direct vascular supply of nourishment, did not frequently suffer in their nutrition. Indeed, reasoning *a priori*, one would anticipate a proneness upon the part of these avascular structures to accept disaster, in the presence of any cause which would impede their ready supply of nutriment.

I have elsewhere urged that the chronic hyperæmia of the very vascular choroid, however produced, by increasing the contents of the globe brought about increased intra-ocular tension. That in the readily yielding sclerotic of youth is presented to us the interesting clinical phenomena of increasing refraction, and finally progressive myopia. Later in life, however, the changed anatomical conditions materially alter the clinical picture. Here, in the presence of the rigid sclera, we find the conditions which give rise to the cases of violent asthenopia, from intra-ocular pressure, which too frequently passes over into the better appreciated and easily recognized phenomena of glaucoma.

The mechanical interference with the circulation is important. It is obvious that increase of intra-ocular tension, however slight, must produce the mechanical result of interference with the circulation of blood and secreted fluid through the organ. The veins being more readily compressible than the arteries, would not so readily, under pressure, empty the eye of its venous blood, which, as a physical necessity would control in a measure the ingress of the nourishing arterial supply. By this mechanical means, the circulation would be at least measurably retarded, and the nutrition of the organ suffer a proportionate interference. In like manner the lymph channels and absorbents would be in a measure defeated in the proper performance of their functions. It is simply reasonable to suppose that these avascular tissues, the vitreous body, the lens and cornea would be prone to suffer harm, and the correctness of such reasoning is borne out by clinical experience, since if we find a sufficient explanation of the steamy cornea of inflammatory glaucoma, the hazy vitreous with its web-like opacities in irido-choroiditis or cystitis, and the swollen, opalescent lens with peripheral spiculæ of opacity, and the steamy nucleus of incipient cataract. In youth these phenomena are averted by the relief of pressure through the expansion of the globe.

but nevertheless result in the evils of progressive myopia.

While the uncorrected errors of refraction, particularly in the educated classes, and in those whose vocation demands accurate vision at a near point, are doubtless the most frequent cause of the choroidal conditions which are here described, there are numerous other causes, which are sufficient in themselves to set up and maintain an analogous choroidal state, and are equally baneful in producing the dangerous sequelæ which befall the eye after forty years of age. Among the most important of these causes is exposure to light and heat: *e. g.*, in the case of the artisan at his work-bench, facing, with his unprotected eyes, a window or gas-jet for many hours in every day; the cook over the heated range; glass-blowers, puddlers, stokers and engineers. Such persons are quite uniformly the subjects of subacute choroiditis, presenting pigment clouds and absorption splotches in the choroid, and red optic disks, with blurred margins, and very often with fine webs in the vitreous, or impaired transparency. It has fallen to my lot to see many examples of this, and, in not a few, posterior capsular opacities and opaque spiculæ in the margins of the lens. At my request, Dr. George E. de Schweinitz examined twenty-five men employed in one of the most extensive iron works in this country, selecting those whose employment exposed them to the intense light and heat of the molten metal. With only two exceptions, these men were subjects of well-marked choroidal disturbance. It was interesting to note that the most marked changes were present in that eye on the side which the man habitually turned toward the furnace in working the heated metal. Other causes were carefully excluded in every case.

Another fruitful source of trouble is the prevailing notion that it is best for the patient to avoid the use of presbyopic glasses as long as possible. It is obvious that all the evils attending upon eye-strain are here present even in the emmetropic eye, and that, too, at a period of life when the attending dangers are enhanced.

I recall the case of an eminent clergyman, æt. 50, with emmetropic eyes, who, although an industrious student and author, had not worn glasses. He came complaining of burning eyes, with a sense of fullness or tension, during and after his work, and severe occipital pain, which caused him not a little anxiety, because of its possible grave import. He had marked choroido-retinal irritation, and suffered greatly from insomnia. He received presbyopic glasses, and in a few weeks his headache and insomnia had disappeared, and with it his anxiety about his anticipated nervous break-down.

A still more marked example of the possible results from this erroneous habit of avoiding the

use of glasses to correct presbyopia was presented in the following case:

A postmaster, in robust health, æt. 49, with a low grade of H. As, had managed to attend to his duties without the aid of glasses. He complained of muscæ, blind spells, diplopia on looking up after reading—which occasionally persisted to his great annoyance—and insomnia. He had pin-head pupils, shallow anterior chambers, red and watery eyes, increased tension, and dilated anterior ciliary vessels. His vision, however, was nearly normal, but failed quickly. There was no contraction of the field. The symptoms slowly disappeared under correcting glasses, but not until after prolonged use of homatropia and rest. Here, too, there was well-marked eye-ground changes. Glaucoma in this case seemed to be imminent.

In looking over the clinical records I have been struck with the much greater frequency with which the lower part of the lens was involved than the upper, the commencing opacity almost habitually being below. It is in the lower part of the choroid also we ordinarily find the most marked pathological change, in many cases, particularly in clerks who sit facing window or gas light at their work, or in the case of artisans who are frequently compelled to stand at the work bench facing the light.

There is probably no question in the minds of ophthalmic surgeons regarding the causes of the choroidal engorgement and disease, but it is my purpose to show, that there is a positive relation between this choroidal state and the lenticular disease. That these deductions are not based upon purely theoretical grounds find ample demonstrations in the following statistics gleaned from my private case-book by Dr. John T. Carpenter, Jr.

A brief analysis of eighty cases with incipient cataract gave the following interesting results. The ages ranged from one æt. 26 years to one æt. 87 years, and presented all stages of development of the opacity.

In *thirty-seven* cases there was a clear history of "weak eyes" and long standing asthenopia, *i. e.* headache following use of the eyes; recurring styes, olephritis, etc., often dating back to childhood. In the remaining cases there was either no note bearing upon this point, or it was noted as absent. There was demonstrable refraction errors present in *fifty-eight* cases—either in one or both eyes. These errors were also noted as present if, *e. g.*, the individual brought his glasses, worn for distance before the failing vision from his cataractous lenses was observed, even though the opacity was too far advanced to permit the determination of the refraction at the time of the consultation.

In the remaining cases it was either impossible to determine the state of the refraction, or its

study had been neglected since. No information could be gained from the records. Vitreous opacities, webs, etc., are noted as observed in *twenty-two* of the cases, and chroiditis in *fifty-eight*. In many of these areas of pigment absorption, macular disease, choroidal splotches and other gross changes are carefully described, as present in one or both eyes. The wooly choroid, crescents of choroiditis at margins of the nerve and pigment absorption, "ripe peach" choroid etc., are included in this group, if the conditions were sufficiently marked to be justly regarded as a disturbing factor in the nutrition of the eye.

In some instances the opacity was too far advanced to admit of any study of the fundus oculi, on one side, but if choroidal changes or vitreous opacities were present in the better eye, the case was included as one of choroidal disease, whether the eye in which the study was made presented lenticular opacity or not.

The frequency with which the affections of the external tunica was noted as present forms also a striking feature of this group of cases. The conjunctival irritation, partial retention of tears, swollen caruncles, and blenorrhœa of the lachrymal sac were observed in *forty-five* cases. In the remainder the record was silent. The frequency with which affections of the lachrymal sac had been noted and treated, was a source of surprise.

The number of cases might have been greatly enlarged, but these were sufficient to show the very obvious relation which exists between the formation of opacities in the crystalline lens, and local pathological conditions, and if they serve to show that incipient cataracts, in many instances, belong in the category of possible preventable diseases of the eye, the purpose of the essay will have been attained.

Among the many interesting details which appear in the study of these cases, is the fact that after the opacity has advanced sufficiently to prevent the use of the eyes at near work, and to exclude the light, that then the asthenopia and external inflammation gradually subsided. It is probable that the enforced rest thus secured to the eye permits also the gradual subsidence of the choroidal disease.

In this fact Nature affords us a suggestion for the management of these cases at an earlier stage in their history, when by rest and appropriate treatment, it is still possible to cure the choroidal disease. If the progress of the opacity is not by this means arrested at a point where useful vision is still possible, the prognosis upon operative interference would be more favorable than would be the case in a badly nourished organ.

The following cases related in some detail have been chosen as typical of the conditions described, and as incidentally illustrating the practical advantages which must follow advice based upon the views here set forth.

Case 1.—Incipient Cataract, Choroiditis, Asthenopia, Failing Vision. Mrs. L. æt. 63, consulted me in May, 1879, complaining of weak eyes, failing vision, headaches, to which she had always been subject, itching and burning of the eyelids. Recently she had made repeated changes in her reading glasses but without material benefit—three times within the year.

The caruncles were swollen and the conjunctiva was injected. V $\frac{2}{0}$ in each eye. She wears +.50 D. for near work, and with it reads Jr. 4. with difficulty.

The ophthalmoscope reveals a hazy image of the details of the fundus. The anterior chamber was shallow, pupils reacted to light and shade, and dilated to large medium under a mydriatic. The lens was now seen to be opalescent throughout, and at the inner border there was a cloud-like opacity and a few spicules of opaque lens projecting along the posterior capsule toward the pole.

In the left eye there were also numerous opaque spiculæ along the border of the lens, and a cloud in the outer part. There were in both eyes vitreous webs, which, with a convex glass, could be seen to move with a slight to and-fro movement with the motions of the eyes. The use of the eyes for all near work was forbidden, and a tonic and alterative treatment advised.

A weak solution of atropia with an astringent wash were directed locally. A month later V. had risen to $\frac{2}{0}$ in each eye, and the general discomfort and headaches much diminished. She then received +9, for reading, and was allowed to do a moderate amount of work. In 1883, she was last seen. The vitreous webs still remained, but the swelling and opacity of the lens had not increased, a much clearer view of the eye-ground could be had, and her general condition had much improved.

At her first visit she had been advised of the threatened cataract, and that in all probability her vision would grow worse. The gratifying result of treatment was a surprise both to the patient and myself. Without such treatment there can be but little doubt that the lenticular opacity would have advanced to ripe cataract.

Case 2.—Hypermetropic Astigmatism, Asthenopia from childhood, Failing Vision, Choroiditis, Incipient Cataract. Progress arrested. Mrs. T., æt. 60, came in January, 1884, because of recent rapid failure of vision, both for near and distant objects, and that she could not get glasses to aid her.

O. D. V = $\frac{2}{0}$ O. S. V = $\frac{2}{0}$. Not improved by any glass. No note was made of the external condition of the eyes.

She had been a great sufferer from headache all her life; had even as a school girl recognized the relation between the use of her eyes and the onset of pain in her head. Both lenses were strong-

ly reflecting. After dilating the pupils both lenses were opalescent, nuclei plainly outlined, and sectors of lenses visible, and there were innumerable small spiculæ in the periphery. With the strong illumination of the inverted image, the blurred details of the fundus could be seen, revealing well-marked choroiditis. She was on her way to her home in Kentucky, and could not stay for treatment. She was apprised of the nature of her trouble, and the importance of rest for the eyes was insisted upon. Potassium iodide prescribed internally, and a weak solution of sulphate of eserine locally. She returned a year later, January, 1885, having at first experienced relief from her headache, but lately it had returned, and with it increased fogginess of her vision. Potassium iodide and bromide were now prescribed, and homatropine locally, together with protecting smoked glasses. Numerous unsuccessful attempts were made to improve the vision by glasses. After a month, during which the treatment had been faithfully carried out, she selected without difficulty, although the opalescent condition of the lens remained as before, O. D. + .50 s. \bigcirc —2c. ax. $150^\circ V = \frac{2}{5}$. O. S.—.75c. ax. $90^\circ V = \frac{2}{5}$. These glasses were prescribed for distance, and another calculated from them given for reading. The internal use of potassium iodide, alternating with iodide of iron, was continued for another month, when she was allowed to return to her home. Two years later she sent report by a relative that there had been no return of trouble, and that she was using her eyes without anxiety or pain.

In this case the usual train of symptoms and local appearances were presented which characterize the incipient stage of cataract, viz.: the failing or "foggy" vision, the swollen opalescent lens and peripheral spiculæ. Under treatment, which improved the health of the choroid, the vision improved, notwithstanding the fact that no change had taken place in the opacity of the lens fibres. The mixed astigmatism in the right eye, and the simple myopic astigmatism in the left, were doubtless important factors in the life-long history of these eyes.

Case 3. Choroiditis, Simple M. As., Vitreous Opacities, Incipient Cataract.—Mrs. H., æt. 63, November 10, 1884, complains of recent rapid failure of vision, which has progressed until she can no longer get a glass with which she can read. Has been near-sighted since about 15 years of age. Is certain that in early childhood she was not myopic. Any attempt to look at near objects brings on smarting sensation in the lids, and lachrymation. Eyes are red and watery, and have been so for many years. Strong white reflex from the small pupils on both sides, and anterior chamber in both eyes shallow. After dilatation both lenses were found to be opalescent, steeple-like projections from all parts of their

periphery, the centres still remaining sufficiently clear to permit a foggy view of the eye-ground. There were numerous vitreous opacities, and a general haziness which appeared to be due to the untransparent vitreous body. Through it, however, with the inverted image, could be seen numerous splotches in the choroid, and large atrophic crescents to the temporal side of both optic nerves. O. D. V. = $\frac{2}{10}$, O. S. V. = $\frac{2}{10}$. She selects concave glasses, but they do not improve her ability to distinguish the letters. She received potassium iodide and bromide, $\bar{a}\bar{a}$ gr. v, t. d., smoked glasses, and a solution of homatropine to be instilled four times each day. Also a wash of boracic acid, and the tear ducts were syringed with the same solution on alternate days. In two weeks she volunteered the statement that her vision was much clearer, — V. = $\frac{2}{4}$? without glasses. Treatment was continued from November 10, 1884, to December 9, 1884. She then selected readily the following formula for glasses: O. D. — 2.75 c. ax. $105^\circ V = \frac{2}{3}$ —. O. S — 2.25 c. ax. $75^\circ V = \frac{2}{5} +$. The homatropine was then stopped, and the correcting glasses given, to be worn, except for near work. The potassium iodide was continued. A week later she received for reading O. D. + 2.75 c. ax. 15° , O. S. + .50 s. \bigcirc + 2.25 c. ax. 165° .

August 28, 1888, Mrs. H. came by request. V. = $\frac{2}{3}$ with each eye. Has worn her glasses constantly with great satisfaction. The conjunctiva is healthy, the choroidal splotches and crescents remain, but active inflammatory processes have disappeared. There is no swelling of the lens, but the opaque spiculæ are as before described.

November, 1890, Mrs. H. returned, suffering from a relapse. V. had sunk to $\frac{2}{10}$, she was suffering from headache, aggravated by any attempt to use the eyes or by exposure to light, and was afflicted by marked insomnia. The caruncles were swollen, the conjunctiva of tarsi soaked in tears, the eyes being red and watery. She was greatly annoyed by constant "itching" of the lids. After reading for a few minutes the page blurred, and she was forced to desist. The anterior chamber was shallow, irides reacted sluggishly, and the ophthalmoscope afforded only a foggy view of the eye-ground. Through the dilated pupils, a fine web and a granular detritus could be seen with + 4 D., moving slightly to and fro with each movement of the eye. The lens was swollen, but no new opacities. The relapse had followed an attack of influenza, which had greatly depressed her general nutrition. She was much alarmed, since a sister had but recently suffered an unsuccessful operation for cataract, at the hands of a homœopathic surgeon, and a brother had just placed himself under my care for rapidly increasing opacity of the lens, associated with vitreous opacities, bad choroiditis and myopic

astigmatism. Under treatment by homatropine locally, rest and smoked glasses, and the internal administration of tonics and alteratives, the headache, insomnia and local inflammation slowly subsided once more, and the vision steadily improved until, in the following February, 1891, she was once more able to read the letters in xxx at 20° with some difficulty, and she was discharged from any active treatment, having for the past month used a wash of boracic acid and a weak solution of eserine locally.

Case 4.—Miss S., æt. 81, came complaining of failing vision, violent headaches, giddiness and nausea, which followed any protracted use of the eyes. She had used convex glasses for reading up to her 78th year, when she discovered that they were no longer needful. She had always been subject to attacks of headache, which she said made her eyes weak. O. D. V. = $\frac{1}{5}$, O. S. V. = $\frac{1}{2}$. Slightly improved by concave glasses, confusion letters miscalled T + ? Eyes red and watery, caruncles swollen, conjunctiva injected, pupils dilated, large medium under homatropine. Lens in both eyes is strongly refracting, nucleus steamy and plainly outlined. In extreme periphery of both opaque spiculæ are seen shooting toward the pole in both posterior and anterior cortex. All the conditions more advanced in right eye. There was a large conus embracing the temporal margin of the optic nerve, semi-atrophic at the nerve margin, and imperceptibly losing itself in less marked choroidal changes as the macular region was reached. There was a woolly eye-ground throughout, and in places advanced pigment absorption. In O. S. the same conditions were present. There was no albuminuria or glycosuria. She was placed upon syrup of hydriodic acid internally, boric acid wash and homatropine locally. In a week the headache was greatly alleviated, the external redness and irritation was much better. At the end of a month she had so far improved that she experienced no difficulty in selecting correcting glasses, O. D. — 1.50 \bigcirc — 1, \bigcirc ax. 105° V. $\frac{2}{30}$, O. S. — .50 \bigcirc ax. 30° V. $\frac{2}{30}$ dif. —. The vitreous haze had disappeared, the eye ground was greatly improved, the anterior chamber was of normal depth, lenticular opacity unchanged. T. u. No headache. There are no changes in the lenticular opacity. She received her glasses for constant wear in October, 1890, and a suitable formula for reading. All went well until the following January, 1891, when she returned, suffering from dim vision, headache and insomnia, which she said was brought about by too constant use of the eyes in working over Christmas presents for her friends. Under the same treatment the symptoms subsided, but V. in O. D. had sunk to $\frac{2}{50}$, and there was a distinct increase in the number and size of spiculæ in the lens. In April, V. remained as before, $\frac{2}{50}$, O. S. $\frac{2}{20}$ with difficulty,

and the intraocular conditions were approaching a condition of health.

It is not my purpose to weary the Section with a report of cases, only so far as is needful to present the clinical picture I have in mind. It will be observed that in the foregoing cases, there is a distinct history of long standing eye trouble, either recognized as such, or obviously present as indicated by the asthenopic history. The cases brought forward are simply examples taken from a large group, and are not intended to carry weight by their numbers. In each case the inflammation of the external tunica and the choroïditis were present. The results of treatment were very gratifying.

In my former paper, I presented a condensed statement of 64 cases of incipient cataract, hurriedly collated from my private case-books by Dr. Ring. In the preparation for the present paper, the deductions are based upon still other cases, taken from my private records, carefully tabulated by Dr. Carpenter, but do not materially alter the results based upon the smaller number. In it, however, are included not only incipient but mature cataracts. It is obvious from this statement, that figures cannot accurately express the true state of affairs, *e. g.*, the table shows over 70 per cent. of demonstrable intraocular disease. Had it been possible to study the eye-ground in all cases, it is probable that this percentage would have been still higher, since it was rarely absent where such examination was possible. There was a distinct asthenopic history in 47 per cent. of all the cases, and refractive error in 70 per cent.

In closing this paper, I repeat the conclusions closing the former paper, since a further study and widening clinical experience have served to strengthen the conclusions there expressed:

"In the views here expressed we find additional argument favoring the great importance of carefully correcting the refractive defects in the eye, since they lie at the foundation of certain diseases which strike at the very root of the vital processes upon which the health of the eye depends. It would seem to justify, furthermore, the conclusion: That, *while opacity of the lens is a disease of advanced life, it does not, in all probability, depend upon senile change, but is originated in local pathological states involving the nutrition of the eye itself.* That hence, in the stage of incipency, it is amenable to treatment by such measures as are calculated to remove the choroidal disease upon which it depends. That if these deductions are true, we are justifiable in giving a more hopeful prognosis to many persons who apply for treatment with incipient cataract. That if treatment fails to arrest the progressive degeneration in the lens, by virtue of the treatment adopted, the eye will be in a better condition to submit to the trials of operative interference."

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HOW SHOULD CATARACT OPERATIONS BE PERFORMED?

Read in the Section of Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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That the technique of cataract operations is the most important element in success, no ophthalmic surgeon questions. Every improved step in the removal of an opaque lens has advanced the percentage of cures, until failures are the very rare exception, to a generally acknowledged fact that cataract extractions, formerly so fatal to the eye, have become the most perfect of surgical procedures. As a young graduate I found myself in Paris, the pupil of the elder Desmarres, when cataract extraction was by no means a common operation because of its difficulties, its dangers and its frequent failures. The common cataract operation of my early professional life was couching, a procedure that most of the ophthalmic surgeons of the present day have never seen performed. As you know, it was the displacement of the opaque lens from its capsular bed in the vitreous chamber, so as to free the pupil and allow light to form pictures upon the retina. The immediate and momentary results of this operation were very brilliant. The staff needle was the magician's wand. With it the blind eye was apparently touched, and sight was instantly restored. In the twinkling of an eye, from seeing nothing, the patient could behold the face of the surgeon who had performed this miraculous cure, and would be loud in his expressions of gratitude. The operation bore success upon its very face, and was declared such to the admiring class of professional attendants. This was in the early days of Napoleon the Third, and in France chin beards were in favor. If the surgeon were ambidextrous, he would steady the head of the male patient firmly, holding the beard with one hand, while with the other he would plunge the needle into the temporal side of the eye, and make the point appear in the pupil from behind the iris. In a moment the lens would be forced out of its position, through hyaloid tissues, into the lower part of the vitreous chamber, where it would be left resting against the retina and ciliary border. By changing hands in case of double cataract, the other eye would be in like manner impaled, and the lens displaced from before the pupil. This performance was truly the *coup d'état* of the operating room. Two brilliant, successful operations for cataract would be scored. The lids were then closed by strips of black court-plaster, and the patient sent to the ward, from which only a limited number reappeared with sight. In a large number of those operated upon, painful inflammations would sooner or later set in, to the de-

struction of the vision which a momentary glimpse had promised to the patient.

At that time, when couching was of daily occurrence, I saw but very few extractions. The operation was deemed too serious for general application, and was rarely attempted by the most skilful. For it patients were selected and were carefully prepared by days of medication, and also days of training, so that the eyes could be kept quiet while the manual was being perfected with the broad knife. The patient was put to bed before the operation was commenced, and every precaution was used to avoid motion of the body during the whole bed treatment. The eyes were kept carefully bandaged for days. With all of these precautions, failures were so frequent as to deter many blind persons from accepting the ordeal. If every other eye turned out well, the successful surgeon was satisfied with his work, and was congratulated by his colleagues.

What great changes have been brought about in my personal experience! From the satisfaction of not losing more than 50 per cent. of eyes under cataract extraction, some at the present day feel unhappy if they lose a single eye out of a hundred cases of simple senile cataract operation. All of this the improved technique of the operation has accomplished. The ideal cataract extraction seems nearly attained by the methods now adopted. Asepsis and antisepsis have largely brought this about. To have absolutely clean instruments, as well as sharp ones, is a very important integral part of the work. There was a time in my early experience when every cataract patient had to be especially prepared by days of medication and dieting before they were made fit, or as we now see it, before they were made unfit, to undergo the operation of extraction. The instruments used were considered in good order provided there were no rust spots upon them. Our present knowledge, that invisible pathogenic germs introduced into wounds by bright instruments excite destructive inflammation; also that active purgation is not the universal panacea for reëstablishing or maintaining health, has revolutionized the work of the ophthalmic surgeon. He now devotes more time to the purification of his instruments, his hands, and the eye to be operated upon, and less to the disturbance of the healthy natural condition of his patient. At the present time, most of my cataract extractions are made on the day that the patients present themselves for treatment. In hospital practice, they are sent from the free dispensary to the operating room, a warm bath in transit, for general cleansing purposes, being the only preparation made. My method of cleansing instruments is to plunge them into boiling water. I prefer this to soaking them in a carbolic or a boric acid solution. I find the boiling water the most speedy antiseptic or aseptic treat-

ment, without detriment to the cutting quality of the instruments. After the instillation of a 4 per cent. solution of cocaine for five minutes, I wash the eyeball with a stream of sublimate solution, 1-4,000, and attribute more benefit to the thorough cleansing of the conjunctival surface by water thrown from an irrigator than by the momentary action of the mercurial solution. I consider this more asepsis than antiseptis, and would place as much confidence in a stream of unmedicated water that had recently been sterilized by boiling.

A properly made wire speculum seems to me the ideal method of keeping the lids apart. The instrument should lie flat to the temple, and should make no pressure upon the eyeball. All eye specula by no means carry out these indications. Some use the speculum only to complete the corneal section. I prefer keeping it in place from the beginning to the end of the operation.

I also use the fixation forceps until the lens is extracted. I feel that the eye is safer by so doing. Some use the forceps only to aid in the corneal section, and trust to their control of the patient during the remaining and important steps of liberating the lens. This always seems to me a needless risk. With many patients the eye will involuntarily roll up suddenly at a most inopportune moment, when instruments are within the eye chamber. Unless extreme vigilance and great dexterity is used to anticipate these eye movements, serious injury to the eye will occur. As against this confidence in the patient's ability to keep the eye quiet, I find the judicious use of the fixation forceps a better guarantee against accident.

By nearly universal consent, the corneal wound is made under the upper lid, and is restricted to the clear cornea, although the puncture and counterpuncture are placed in the limbus, where the white sclerotic overlaps the clear cornea. This is done to give width to the opening. The long, narrow, sharp pointed and keen cutting knife of Graefe is in universal use. To do all that is expected of it requires the constant care of a good cutler. In making the section, most surgeons follow the corneal curvature in a line just within the clear corneal boundary. The varied size of the opening through which the lens is to escape without squeezing the angles of the corneal wound, is secured by approaching more or less to the horizontal meridian in the transfixion. This needs experience and judgment to determine in advance, in each case, the size of the lens to be extruded. In making the corneal section some cut with the point of the knife, and then with the heel—a sawing motion. Others complete the entire section by making the point follow the corneal curvature as the blade is pushed forward. These are peculiarities of the operator, and are non essential, provided the knife is

dextrously handled, and pressure is not made upon the iris by the blade of the knife in the to and fro movements of sawing. When an iridectomy is to be made, it is now generally agreed that the coloboma should be small. By seizing the iris near the pupillary border with the iris forceps, it is drawn vertically upwards. As soon as the pigmented pupillary edge is seen out of the corneal wound, this protruding portion of the iris is cut off by one snip of the scissors. This gives a comparatively small opening which will not be conspicuous, nor will it permit too much irregular refraction. The method of opening the capsule is still a mooted point. To tear off and take away the anterior surface of the capsule is undoubtedly the ideal method, as it does away with the secondary operations. With an iridectomy and a properly constructed forceps, this can be readily effected. When the iris is left intact, it requires nice manipulation to avoid including the iris in the blade of the forceps. In opening the capsule with the cystotome, much is said of the cutting properties of this diminutive blade, which seldom acts as a knife, but tears the capsule with its sharp point. Provided the rent is made large enough to let the lens out freely, it seems to matter little whether it be in triangular or in T shape. Either of these seems preferable to the horizontal cut over the upper edge of the lens, which leaves the anterior capsule to be disposed of by a secondary capsulotomy some weeks after the extraction. The delivery of the lens is made either by curette pressure on the cornea, or by finger pressure through the lids, the speculum being previously withdrawn. When the patient can be relied upon to direct his eye as the operator desires, no great difficulty presents for finger manipulation. I, with the majority of surgeons, prefer to retain the speculum until the pupil is cleared of all lens substance. I find that when the corneal wound has been made to correspond with the size of the lens to be extracted, the pressure of a shell spoon below the ciliary border tilts the upper edge of the lens forward as well as starts its movement upwards, and delivery is accomplished by following with the spoon the lens as it advances. In the majority of cases, by spoon manipulation on the cornea all lens substance can be removed, even when the iris is left intact. When the lens seems to stick to the inner face of the iris, I have found much benefit in making pressure with the fixation forceps above the corneal wound. Beside keeping the eye quiet it helps to direct the upper edge of the lens through the corneal opening. To get out fragments of lens which are disposed to remain notwithstanding spoon pressure, I have sometimes used the curette, as is constantly done by Galezowski; or I have washed out the chamber, as is the constant practice of De Wecker. I do not find it necessary to use either of these methods habitu-

ally, as do those surgeons. I have found at times the forceps of great value in recovering fragments of thickened capsule. Recently, in one instance of capsule so thick that the effort of dividing it ruptured the suspensory ligament, I seized the capsule with forceps, and delivered the lens entire in capsule by traction. It was without iridectomy, and gave perfect final results. In another case, equally without iridectomy, with thick capsule which did not yield promptly to the cystotome, I drew out the entire capsule by forceps, and then by pressure removed the lens. There is no doubt but that a very important part of the ideal operation of cataract extraction is to leave the pupil clean of all lens detritus. This should be effected by patient, delicate manipulation, using curette, syringe or forceps, as the indication may demand. When iridectomy has been performed, it is important to have the angle of the corneal wound freed from the presence of any fold of iris, and the spud should be used to dislodge any portion of this membrane which may have been caught in the lips of the wound. When no iridectomy is done, in the majority of cases, after pupil cleansing, the iris resumes its normal position with round central pupil. Should the pupil be irregular, or the iris tend to prolapse, it should be replaced *in situ* by smoothing it out with the side of the spud, using gentle lateral pressure on the face of the iris in the anterior chamber to release any pinching of the iris by the angle of the corneal wound. If the iris be injured in the lens exit, or its tendency to prolapse shows itself, it would be better at once to convert the operation into one with iridectomy, rather than run the risk of an iritic hernia after the final dressing is made. The cleansing of the corneal wound of any blood clot, and the removal of all lens detritus from the conjunctiva, complete the operation. If no iridectomy has been practiced, a drop of an eserine solution, $\frac{1}{2}$ per cent. strength, is placed upon the cornea, otherwise the eye is ready for the permanent dressing. With the closing of the lids after a careful operation, at least nine-tenths of the dangers against a successful result have been already successfully met. In my professional experience it matters little how the eye is dressed, provided the upper lid be kept for a few days over the corneal wound, for its uniform support whilst healing, and provided no irregular pressure be made upon the cut eyeball by badly adjusted compresses, or by too tightly tied bandages. Experience has led me to adopt the lightest of dressing, and the avoidance of dark rooms. I feel also quite assured that we have all erred in inflicting too much bodily restraint, to the annoyance of our patients. To be sure, we get finally good eyes after carefully performed operations, when we keep patients in bed, on their backs in dark rooms; but we equally get good results in like proportion after carefully per-

formed operations, when we do not treat them as bed patients. It is more the careful technique, and not so much the after-treatment, that increases the percentage of cures. I am glad to say that I see a general relaxation from the rigid rules for dark rooms and bed confinement in such universal use a few years back. I am sure that this rational change is for the good of both surgeon and patient.

The ideal extraction of simple senile cataract is undoubtedly without iridectomy, making a flap opening in the upper segment of the clear cornea, destroying, or better, removing the anterior face of the capsule, and getting rid of all lens detritus from the pupil. The operation of extraction without iridectomy is evidently growing in favor. With myself it is decidedly so, as shown by my annual hospital reports. The report of work done at the Presbyterian Eye, Ear and Throat Hospital of Baltimore City for 1887, gives 83 cataract extractions, all with iridectomy. For 1888, 97 extractions of senile cataract, of which 40 were done with iridectomy and 57 without. For the year 1889, of 93 extractions, 33 were with iridectomy and 60 were without. For last year, 1890, of 113 extractions, 93 were without iridectomy, and only 20 with iridectomy. Unless especially contraindicated, all simple senile cataracts are extracted by me without iridectomy. When accidents occur to the iris during the corneal section, or during the escape of the lens, it may be proper to excise a portion. In some cases, when the iris is replaced after the lens has been extracted, it shows a tendency to prolapse, notwithstanding the instillation of eserine. Should such be noted, it is better to remove the protruding portion of iris, and in this way avoid the accidents of iritic hernia during the after-treatment.

PRESSURE ON THE GLOBE AFTER CATARACT EXTRACTION.

Read in the Section on Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C. May, 1891.

BY EDWARD JACKSON, A.M., M.D.,

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What is to be said under this head will also apply to all operations involving the section of the cornea or sclero-corneal junction; but is of greatest importance with reference to cataract extraction since it involves the most extensive of these sections.

In the normal eye the contents of the sclero-corneal coat press outward at every point with a force represented by a column of mercury about thirty millimetres in height; and the sclero-corneal coat at every point successfully withstands this pressure, by its own continuity and firm

structure. The instant a corneal section is made by the solution in the continuity of the coat its power of resisting outward pressure is annihilated. But as the same section also permits the contents of the globe to freely escape, the outward pressure is annihilated and thus a new and equally perfect equilibrium is established. My plea is that we shall respect this new equilibrium, and not destroy it by excess of external pressure.

At the close of a perfectly satisfactory cataract extraction, the lips of the corneal wound are held by the physical properties of the sclero-corneal coat in perfect apposition; the globe has its normal contour. If there is any deviation from this ideal condition it is always in the direction of deficient contents in the globe and tendency of the cornea to flatten or collapse. And if there be any tendency to gaping of the wound that tendency is due to distortion from sinking in of some other part of the sclero-corneal coat; the necessary manipulations of the globe having pressed out so large a proportion of its contents that the secreting tissues have not had time to replace it. And so long as the corneal section remains pervious, permitting the escape of the aqueous, it is impossible that the pressure in the anterior chamber should become excessive and cause any bulging of the section and adjoining tissue.

When, however, the lips of the wound have become adherent throughout their length; so that all escape of fluid through the wound is checked, and the aqueous is compelled to seek its normal channels, the tension of the globe, the outward pressure of its contents, rapidly rises toward the normal. But as yet the union of the lips of the wound, and the lips themselves, softened by the nutritive changes attending the healing process, are less able to withstand this pressure than the other parts of the sclero corneal coat, and they relatively yield before it in a local bulging. The appearance of this bulging is about the best evidence we have, that the wound has closed throughout its length.

This bulging of the cicatrix reaches its maximum in a very few days after its first appearance, usually within forty-eight hours; and from that time, if the tension of the eye be not sustained notably above the normal, it continues to diminish until it has entirely passed away, under the influence of normal cicatricial contraction of the scar. I have never seen permanent noticeable bulging, unless the iris were incarcerated in the wound, and in simple incarceration without prolapse it may disappear entirely. So much for the natural history of the scar after a cataract extraction. Let us approach the subject from another point of view.

In reporting some cases of glaucoma in which, after other operations, enucleation had been done and the globes subjected to careful study microscopically, before the meeting of the American

Ophthalmological Society in 1887, Dr. Wm. F. Norris says: "A study of the cicatrices of these operations (iridectomies and one cataract extraction) shows in each case a displacement of the relative position of the corneal flap and the corneal stump from which it was cut. In each instance the edge of the flap rides up a little, while the cut edge of the proximal portion of the cornea projects deeper into the anterior chamber. In comparing them with the beautiful and careful drawings of Becker in his "Atlas of the Pathological Topography of the Eye," we find that a large majority of his plates, representing flap operations with and without iridectomy, Graefe extractions and iridectomies, show a displacement of the cut edges in a corresponding manner, while two of them give examples of the end of flap being deeper in the anterior chamber, while the proximal edge of the cornea rises slightly above it. In a few instances only, are the inner edges of the incision nearly on the same level." Dr. Norris thinks: "These facts present good anatomical reasons for the utmost diligence on the part of the practitioner to prevent any undue motion of either the body or eyes of the patient after operations, until the wound is sufficiently closed by adherence of the cut surfaces to make it probable that it will not give way or be displaced."

Without questioning the correctness and importance of Dr. Norris' conclusion, it seems to me that the facts to which he draws attention, and his observations can be readily verified by inspection of the photographic reproductions of the appearances in question, give us even more definite indications as to the cause of displacement to be especially guarded against after cataract extraction.

In general the corneal incision in a cataract extraction is not perpendicular to the portion of the cornea through which it passes; but is so inclined that the oblique edge of the flap overlies the corresponding surface of the stump from which it has been cut, in such a way that if the parts are drawn asunder the overlapping will diminish, but if they are thrust together, the over-riding of the flap will be excessive, and only by displacement of very serious extent can the stump be made to over-ride the flap.

When, after the completion of a corneal section the intraocular tension is reduced to zero, the only resistance that is offered to external pressure on the globe is from the elasticity of the coats, tending to reproduce and preserve their normal shape, and this is as great as usual except at the point of incision where it has been for the time entirely destroyed.

Having these facts clearly in mind let us see what is, what necessarily must be, the effect of external pressure on the incised globe.

First, if the pressure be in excess over a limited

portion of the globe its tendency is to push in that part of the scleral or corneal coat, and secondarily there will be a tendency of the neighboring portions of the coat to tilt out. In the uninjured parts of the globe this tendency to tilting out is met and restrained by the inclination of all other parts of the coat to preserve their shape. But with the free edges of flap and stump this restraining influence is removed and a tilting out of the edge may result. Only under such conditions, or by the direct thrusting in of the free edge of the corneal flap, can the over-riding of the stump occur.

But even if external pressure be applied to the globe with practical uniformity, its results will be scarcely better. There being no intraocular tension, such pressure is resisted only by the resilience of the walls of the globe, and by those walls is transmitted as by a perfect arch, until it reaches the point at which the arch is broken by the corneal incision. Here the tendency is to force the two lips of the incision together, and the result is just such a displacement of the lips of the wound as has been found to occur in the large majority of such eyes examined, an over-riding of the flap upon the stump.

Probably the only reason that would be given for pressure on the globe after cataract extraction, at least by the majority of surgeons, would be that it would aid in securing the fixation and complete rest of the globe. The bandage may aid the fixation of the eye in three ways. By preventing the use of the eyes it removes the chief inducement to turn them from place. But for this purpose it is, of course, essential that both eyes be bandaged. Then the constant contact of a dressing with the lids probably exerts a very important reflex influence, restricting those movements of the eyes that are liable to be made in response to sounds from various directions, or in response to impressions made on other senses. Finally the bandage may, by pressure, mechanically resist the movement of the eye; though I believe it can never altogether prevent it. But the restraint of movement by the application of mechanical force to the globe does the very harm that restraint of movement is hoped to prevent. If, in spite of pressure, movement of the globe occurs beneath the bandage, no matter how evenly it is applied, the area of its application, and points of greatest force must vary with every movement of the globe. Pressure simply becomes a sort of massage. And if massage is to be applied, can it not be more rationally done than by the chance movements of the bandaged globe? It is thus evident that in the first stage of healing, until the wound is quite closed, pressure can only do harm. After the complete closing of the wound there is a distinct tendency to bulging, which pressure might be expected to somewhat counteract if it could be applied steadily to the

point of deficient resistance on the part of the coat, and to that point alone. But such use of pressure is manifestly impracticable.

To recapitulate. At the completion of a cataract extraction, or other operations involving a corneal section, an equilibrium without tension is established, while the resiliency of the sclero-corneal coat tends to keep the lips of the incision in the best possible apposition.

That pressure on the globe can only aid in fixing it by doing it mechanical violence, and by the ocular movements is transformed into a species of massage; and whether such pressure be uneven or uniform, it can only tend to cause the relative displacement of the edges of the wound.

Therefore, the primary consideration in the application of a dressing after such an operation is the avoidance of all pressure.

TO WHAT EXTENT ARE PERSONAL RESTRAINTS ESSENTIAL DURING HEALING OF CORNEAL WOUNDS.

Read before the Section of Ophthalmology of the American Medical Association, at its Meeting in Washington, D. C., May, 1891.

BY T. E. MURRELL, M.D.,
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It is still considered by the majority of ophthalmic surgeons that when the cornea has been extensively incised complete restraint of both eyes, and of the body as well, for some days is essential to safe and perfect healing. This applies to operations on iris or lens requiring opening of the aqueous chamber by a more or less extensive section. Furthermore, in compliance with this opinion, it is considered that such operations should be performed in the room the patient is to occupy in order that as little disturbance of person as possible shall be created. Based upon an individual experience now extending over four year's careful tests and observation, I feel authorized in entering a remonstrance against these iron-bound rules, and take this occasion to offer a plea for greater personal liberties to those subjected to iridectomy or cataract extraction.

It is true, very plausible arguments can be produced in defense of the prevalent custom of bandages, darkened rooms and confinement in bed, but one solitary fact is worth a hundred theories, and experience and observation must always take precedence of abstract reasoning. The restraints ordinarily put upon those who have submitted to an extraction of the lens are often very trying, especially to the aged, the depressing effects of which doubtless often cause tardy healing of the wound. So much do some persons dread confinement in the dark and exclusion of both eyes from sight that under such methods I have sometimes found it very difficult to get the patient's consent

to submit to an operation on the second eye, especially if satisfactory vision has been obtained in the first. But with the very slight restraint I now put upon my patients they regard the operation for cataract and the after treatment as a trivial matter in so far as personal discomfort is concerned.

I had already begun to draw the reins more loosely as regards the points at issue when I became acquainted with Dr. Michell and his methods. I was so impressed with the simplicity as well as philosophy of his dressing and management of his operated cases that I at once adopted his methods, and for a period of four years have used no other.

His statement that he made simple iridectomy an office operation was a surprise to me, but I received it with confidence, and after thorough trial became so convinced of its entire safety that I now no more hesitate to perform an iridectomy in my office, and let the patient walk or ride home than I would to make a paracentesis of the cornea.

Dr. Michell was much more cautious, however, with his extractions, whom he confined to bed a number of days. It occurred to me if the stringent rules I had hitherto followed with my iridectomy cases, which were managed with almost as much caution as an extraction, were unnecessary, then they were likewise, perhaps, to a large extent at least, unnecessary in the latter also. At any rate I determined to make a test of it. I had been in the habit of taking the medical class of our college with me to the room where the patient was to remain, often in distant parts of the city—we then having no satisfactory hospital arrangements—to witness operations for cataract. The next case that applied for relief, I performed the operation in the college building and sent the patient, an old negro man, home, a mile and a half, in an express wagon. The case did as nicely as any I ever had. Encouraged by this I repeated it over and over again with like satisfactory results, leaving to the patients to get home in any manner they could, they sometimes walking a mile or two, always having an attendant. In no instance was there any irregularity in the progress of the cases that I could attribute to this cause.

I had considerable misgivings, however, on one occasion when, during an extraction, a good deal of fluid vitreous was lost. I feared that with only a strip of adhesive plaster over the lids and the patient going more than a mile to his home the balance of the vitreous would run out. But it was not the case. There was no more lost after dressing the eye, healing was by primary union and the result was quite satisfactory.

With such experiences as these, I felt warranted in taking like liberties in my private practice. About this time Dr. Cheatham published a re-

port of cases operated at the medical college and sent home to different parts of the city, all of whom did well.

Dr. Chisolm also made known the fact that he was in the habit of operating in a room downstairs and requiring his patients to walk up-stairs to their room, and that he had seen no harm from it. He furthermore took the initiative in leaving the unoperated eye free, a great pleasure to the patient, and not attended by any bad results. With such corroborative testimony I no longer hesitated to boldly operate in my office on any and all cases that applied, sending them to their homes or boarding houses afterwards. It was with some misgivings that I first tried leaving the unoperated eye open, especially if it had fair vision, on the principle that one eye cannot move without associated movements of the other. Trial of this convinced me in time that it was safe, and I now very rarely close both eyes. Owing to the better facilities to be had in a specially prepared office, and the more readily obtained assistance, besides the greater convenience and saving of time to the surgeon, there is a great gain in performing all operations in ones office. For two years past I have required all my iridectomy and cataract cases, as well as all others, to come to my office for operation, unless, as only occasionally happens, the patient, or family, insists that the operation be done at home. After an iridectomy or extraction only the operated eye is closed by a strip of isinglass plaster, and the patient is sent home in a carriage, or in a street car, or if not very far is allowed to walk home, being always accompanied by another person. He is instructed when he gets home to lie down or sit up as he may prefer, but to keep quiet, and to remain in his room, and not to use the unobscured eye except for some particular necessity, that is, he is not to attempt to read or use it unduly. I find but little disposition on the part of most persons to abuse these privileges.

It will occasionally happen, however, that they do, just as unruly patients will sometimes tear off the bandages.

I made an extraction in my office last winter on an old lady and sent her home, leaving the unoperated eye, which had quite good vision, free and with which she saw her way home. When I called to see her the next day she was not in her room but was in another part of the house quite busy about her domestic duties. She informed me she had been thus engaged from the time she got home from my office and was innocent of there being any harm in it. I at once enjoined her not to attempt the like again, and to remain in her room. Fortunately no harm came from her indiscretion. While such imprudence might lead to dire results, at the same time several similar instances have taught me that there is a great deal of unnecessary fear of

any and all personal liberties after important operations on the eye, that for cataract in particular.

The great secret, in my opinion, lies in a well performed operation in a properly selected case, then closing the lids naturally over the globe and retaining them there by the simplest means, and molesting the eye as little as possible until union of the corneal section has taken place and all will have been done that it is in the power of the surgeon to do to aid Nature in her efforts at repair. As to confinement in bed, the exclusion of light, closely confining both eyes, and any and all personal restraints that bring discomfort, they play no important part in the final results and are both cruel to the patient and useless.

While allowing my patients these greater liberties and additional comforts I have at the same time seen no unsatisfactory results that could in any way be attributed to them.

In fact I have had fewer complications after extraction since doing them in my office than ever before in my experience.

I feel confident that a fair and reasonable trial of the methods I have here described will convince any one that they are not only safe, but that he will be greatly pleased with the convenience and satisfaction they will afford him, while he will have added the gratitude and appreciation of his patients for converting such hitherto formidable operations into seemingly simple ones.

REMARKS ON THE NEED OF MORE EFFICIENT PROTECTION OF THE EYE AFTER CATARACT EX- TRACTION, AND AN IM- PROVED APPARATUS FOR THE PURPOSE.

Read in the Section of Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5-8, 1891.

BY G. E. FROTHINGHAM, M.D.,
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Perfect coaptation and support of the corneal flaps, freedom from any form of pressure that may cause gaping of the lips, or reopening of the wound, and perfect rest of the eye, are the objects mainly in view in adopting any form of dressing after the extraction of cataract. That any imperfect coaptation, or motion of the lips of the wound will interfere with its speedy and perfect union, and, that every reopening of the wound retards recovery and subjects the eye to dangers from infection and inflammatory reaction, are propositions so axiomatic that no one will dispute them. They seem to be universally received principles, though in practice we hardly take the precautions we ought to observe in

order to secure our patients against these sources of danger. Mackenzie in his chapter on the after-treatment of extraction, writes as follows:

"A careful assistant or experienced nurse, sitting constantly by the bedside for the first forty-eight hours, and for several succeeding nights, ought to attentively watch the patient when he wakes, and taking care especially, that he does not turn round suddenly upon the eye which has been cut or put up his hand to rub it. If there is any particular reason to dread the latter accident, it may be proper to muffle the patient's hands and pin them down by his sides.

"The length of time during which the patient is to be kept in bed, is a point upon which there has been a wide diversity of practice. It would appear that Wenzel was at one time in the habit of confining his patients to their backs, without change of posture for a fortnight or three weeks, but that afterwards he shortened the period of confinement to eight or ten days. Mr. Phipps, on the other hand, examined the eyes on the morning after the operation, applied a shade and allowed the patient to rise.¹ A middle course appears to be the most judicious. The incision may be looked at the third day. On the fourth day the patient may be allowed to sit up for a short time. On the fifth the eye may be fairly examined, but immediately afterward covered with a shade. In eight or ten days the patient may be allowed to look at large objects and look about the room."²

Lawrence says: "The coverings of the eye should be light; a soft rag doubled and wetted in water, may be gently bound on the eye by a single narrow linen band, and the other may be covered in the same way. Recollect that the eye is naturally open to the air, and that a sound eye would be heated and rendered uneasy if it were bandaged up.

"The method followed by Beer and most of the German operators, of closing the lids by a strip of sticking plaster carried from the forehead to the cheek seems to me most objectionable.

"We must not, therefore, regard it as a rule, that the patient is to be bandaged. The light covering I have recommended is rather employed to keep the eye quiet, and guard it from any slight accident, than as a measure absolutely necessary; on the latter account it is proper to have the eye covered during the night, but it may be left open, or at least with thin wet rags only on it when the patient is awake."³

This open method of treatment seems to have been quite common until von Graefe advocated the use of the pressure bandage in connection

¹ On the Treatment of Patients after the Operation of Cataract, by Jonathan Wathel Phipps. London. 1792.

² Diseases of the Eye, by William Mackenzie, Edition of 1833. Boston, Carter, Hendee & Co.

³ A Treatise on the Disease of the Eye, by W. Lawrence, F.R.S. London, 1833. Pp. 425 and 426.

with the operation he devised, and which soon became so general.

We are to day debating the same questions that divided the colleagues of Lawrence and Mackenzie. While we do not direct that a faithful assistant or nurse watch continuously by the bedside for two whole days and several succeeding nights to see that no injury is inflicted upon the eye, we may sometimes wish we had.

As it was more than a century ago with the followers of Wenzel and Phipps, so to day we have practically two methods of dressing the eye after cataract extraction.

By one method the lids are kept closed by the application of a cushion of absorbent cotton, charpie, or common cotton, held in place by a protective bandage. This may be applied lightly according to the directions of Stellwag and other writers, or with quite firm pressure, as advised by Graefe, and still preferred by some.

By the other method of dressing the lids are held together by strips of adhesive plaster, the eye being otherwise left free from covering or pressure. This is what is now known as the open method, and is advocated by several members of this Section.

I think it will be conceded that each of these methods has some advantage which the other does not offer, and also that neither fulfils all the indications that we attempt to meet by the dressings we adopt after an extraction.

I think it will also be quite generally admitted that the closed lid, with no artificial pressure, constitutes the best and safest splint for holding the lips of the wound in coaptation after the operation, and that the closing of the lids of both eyes conduces to that perfect rest of the operated eye essential to its greatest safety.

There are many who believe it nearly, if not quite, impossible to apply a bandage with that firmness necessary to maintain its position, without exercising unequal pressure upon the eyeball, sufficient, at times, to interfere with speedy healing of the wound and reëstablishment of the anterior chamber. If the bandage should happen to slip in any way, either from below upward, from above downwards, or from side to side, this unequal pressure is almost sure to be produced, and such accident is not unfrequently the evident cause of reopening of the wound. The method of dressing the eye with large pads of cotton and a pressure bandage has been retained partly with a view of protecting the eye from slight blows, which might prove more harmful in the open method of dressing. That the pad and bandage, though it affords some protection from slight blows, can offer no sufficient resistance to severe blows, is too evident to need discussion.

It has always been my custom to apply with great care the usual pad and bandage, to guard against its slipping by a second bandage of thin

material applied by several turns outside of the first bandage, and passing under the chin and over the vertex, and finally fastening the two securely together, so as to prevent any motion of that part of the original bandage which covers the eyes. To guard against blows I have impressed the assistants with the necessity of great caution in their manipulation, and during sleep have had the patients hands so secured, that while a certain degree of motion was allowed, there was no possibility of getting them up to the eye so as to rub or strike it.

Notwithstanding these precautions several accidents have happened that have impressed me with the need of more efficient means of protection than are in common use, and with the necessity of having such appliance cause so little annoyance to the patient, that they may be willingly tolerated until the wound has had time to become very firmly healed.

A brief account of a few accidents that have happened to my patients will serve to illustrate the nature and extent of the danger against which we ought to provide better protection.

Case 1.—A lady of 55 was operated upon by me for cataract of the left eye, by the old method of simple extraction with Beer's knife. Operation smooth. On the third day the eye was opened. The anterior chamber was restored, the pupil was clear and central, and vision seemed good. On the fourth and fifth days the eye was examined and showed no sign of complication. On the morning of the sixth day, after the eye had been dressed, she suddenly pitched her head forward with considerable force, and struck the operated eye against a chair post. The wound was reopened, the iris prolapsed, and the anterior chamber filled with blood. Although the prolapsed iris was excised and proper care instituted, inflammatory reaction resulted, a secondary operation became necessary and ultimate vision was only $\frac{1}{200}$, where a perfect result seemed almost certain before the accident.

Case 2.—A man, æt. 54, was operated upon for hard cataract of the left eye by Graefe's modified linear operation. The operation was smooth, and the eye was dressed in the usual way with a pad and bandage, and at night the hands were firmly secured to prevent his rubbing or striking the eye while asleep. On the fourth day the eye was examined. The wound was closed, pupil clear, and the eye free from inflammatory or other complications. On the 5th, the eye was dressed and examined, and everything was progressing favorably. On the fifth night the patient had his hands left free without authority. Toward morning the patient was awakened from his sleep by a severe blow upon the operated eye, which he had inflicted upon himself by bringing his hand violently against it. The pain was so severe that I was sent for and visited him at an

early hour. The wound was torn open and the anterior chamber was filled with blood, a clot of which protruded between the lips of the corneal incision. The blood was evacuated as completely as practicable, and the eye carefully dressed. Iritis supervened. A quite thick membrane formed in the pupil, and a secondary operation became necessary. The ultimate vision, fortunately, was good, being $\frac{2}{30}$.

Case 3.—A man, æt. 75, was operated upon by Graefe's method for extraction of cataract of right eye. The operation was smooth and the eye dressed as usual with pad and bandage and hands secured during sleep. On the fourth day the eye was examined. The wound had united, the pupil was clear and the eye free from redness. On the fourth night the patient turned suddenly on his face, struck his eye forcibly against the pillow, causing great pain. On examination of the eye it was found that the wound had been reopened, the anterior chamber was found empty, and the dressings found wet and slightly stained with blood. Dressings were re-applied, and extreme caution urged against further injuries. On the sixth day the wound, which had again united sufficiently to hold the aqueous and restore the anterior chamber, was broken open by the patient while awake. He was sitting in a chair, and, in a state of reverie, suddenly brought his hand to his face, striking his eye with such force as to again re-open the wound. The pain caused by the blow was so intense at first, and the effect of the injury was so great that he nearly fainted. Again the wound united, but with a reddened condition of the eye, and an aggravation of the tenderness, which had existed, to a slight degree, ever since the first blow. On the third day after the second injury, although the attendant tried to watch the patient with great care, he struck the eye again with his hand in a manner similar to that which had caused the second injury, and for the third time re-opening the wound. As a result, a low form of iridocyclitis followed, retarding recovery and ultimately leading to detachment of the retina. The latter result would not have followed, probably, had the patient not wilfully disobeyed instructions and used his eye sooner than he ought to have done under the circumstances.

These are the extreme cases that have occurred in my practice, and I presume that like cases have occurred to most operators, and that slight injuries have quite frequently occurred. They demonstrate that the ordinary pad of cotton and bandage afford but little if any more protection against severe blows, than the open method. Neither can such accidents be guarded against by pinioning the hands of the patient by the side, since he may suddenly turn, as did my patient, upon his face, and produce the injury. Nor can the "careful assistant or trained nurse,"

recommended by Mackenzie and others, prevent them, unless they keep their hands constantly upon the arms of the patient. If they fail to do this, the movement of the patient may be so sudden and rapid that the injury will be done before an attendant can catch and restrain him. Pinioning the hands of the patient becomes so irksome that few will tolerate it and they will loosen their hands and get their attendants to omit the precaution after enduring it for one or two nights.

It would seem that the attention of the profession has not been turned to this subject as much as its importance really demands, for though only an occasional loss of an eye may follow from these injuries, to guard against *any* loss is the object of the prudent practitioner.

Within the last few months two communications on this subject have been made to the profession. The first of these was by Dr. H. Gifford, of Omaha, and appeared in the *Archives of Ophthalmology*, Vol. 19, p. 42. Dr. Gifford proposes to cover both of the eyes with "concave shields of stiff pasteboard, of such shape that the flaring edges may rest upon the bridge of the nose, the forehead and the cheek, while the arched centre is an inch or more from the eyeball. This is kept in place by an elastic band, but over all, to secure firmness, a monocular roller bandage covers that shield which is placed over the operated eye. Dr. Gifford's shield is easily made, and when firmly and securely applied, must offer quite complete protection from the kind of accidents I have mentioned, unless the shield should happen to slip from its place. In that case its edges very likely would take such a direction that one of them would press upon the eyeball. Under this shield the lids may be closed by adhesive plaster, or confined with the ordinary pad and bandage.

The objection to this shield is, that it is even more impervious and heating to the eye than the ordinary bandage, and this is a sufficient consideration to lead some operators to reject it altogether. To remove this objection Dr. J. S. Prout,⁴ of Brooklyn, has proposed a wire mask, made of wire netting such as is used for window screens, and fastened about the head by means of two tapes.

In remedying one defect and offering a covering which is light and cool, he proposed a form of dressing which evidently must be unsafe on two accounts. In the first place, it can hardly be held securely in place by the fastenings he proposes. Secondly, and mainly, it is, and must be, inefficient, by reason of the lack of stiffness, as a protection against the severe blows that are sometimes accidentally received by the operated eye, and against which Dr. Gifford's shield does offer protection. Again, an ordinary wire

⁴ The American Journal of Ophthalmology, January, 1891, p. 1.

netting cannot, even when sufficiently firm, be properly arched by any process to remain as a permanent firm concave surface, an inch or so removed from the surface of the lids. A consideration of the desirability of a dressing that, while cool and allowing free access of air to the eye, yet would be firm enough to resist severe blows, and so secured as to remain in place when applied to the most restless and unruly patients, led me to devise the mask which I here present. This mask is woven by a skilled wire worker, after a pattern which I furnished. By its construction the arch is so firm that a powerful blow cannot indent it, so as to allow of pressure upon the eyeball over which it is applied. It is open and cool. It is fastened in such a way that the tapes cannot slip over the vertex of the head or in any other direction, and allow the mask to become displaced. It is so formed, that should it become displaced, the edges would not strike against the lids, but be carried away from the eyeball. It can be used over any form of dressing. The open method may be followed and the patient allowed to use the unoperated eye if his attendant so desires, or it can be applied over a light pad of cotton, or the pad and bandage both, as the operator may choose.

While by no means perfect, I present it for the consideration of the Section, believing it to be the coolest and the most efficient of any dressing I have seen proposed, for protecting the eye from mechanical injury after extraction of the cataract, or while undergoing treatment for wounds of the eyeball, that might be re-opened by accidental blows or pressure.

DISCUSSION ON CATARACT.

DR. F. C. HOTZ, speaking of the management of cataract cases after the operation, said that whatever different views we might have on this point, we certainly all admit that the final success does not solely depend on a skilful operation, but also on the quick and smooth healing of the wound, and that therefore we are anxious to attain a speedy union of the wound. The necessary condition for first union of any wound is the accurate and undisturbed coaptation of its edges; and all our care and dressings after an operation must have this end in view, to wit: to protect the nicely apposed edges of the wound against any sudden or repeated disturbance. This end can be attained only if we keep *both* eyes closed until the edges of the wound are united. When the operated eye alone is closed, it is of course compelled, by the law of associated muscular action, to follow all the rotations of the other eye. These movements in the act of seeing are quick, and almost incessant; every such movement means a sudden tension upon the sclera by quick muscular contraction; and if the portion of the sclera thus acted on lies in the line of the

operation (as it does in up and down rotations) this sudden muscular tension will necessarily pull the edges of the wound apart. That this does actually occur, is shown by the sharp pain most patients experience, and the discharge of the aqueous humor we can see, when such rotations are made a short time after the operation.

Another factor likewise disturbing the rest and coaptation of the wound edges, is the winking. Every time the seeing eye winks, the orbicularis of the closed eye acts in association with its fellow and makes a sudden pressure through the eyelid upon the globe. Dr. Jackson has just shown us how any sudden pressure upon the cornea, after an operation, will displace the wound edges; and the great discomfort patients experience under these circumstances, confirms it.

Now as to the materials used for dressing, I prefer the absorbent cotton and roller bandage or mosquito netting to the plaster or any other dressing. The cotton, carefully adjusted, forms an elastic cushion which readily adapts itself to the uneven surface of the eyelids. The roller is applied wet, and when the several layers get dry, they are so firmly pasted together that the bandage cannot get out of order; turning the head on the pillow does not affect it, and consequently the cotton under it remains absolutely undisturbed, and you will find it so when you remove the bandage on the second or third day. The object of the bandage is to keep the eyelids closed gently, just as in sleep; its object is not to render the eyeball immobile. It is neither necessary nor could it be done by any degree of pressure; and any bandage which presses is objectionable.

Plaster strips I found very unsatisfactory; they would get loosened by the tears and separated from the lower lid, either altogether, or at least so much as to allow a partial opening of the eye, or they became so dry and hard that their stiffness made the patients very uncomfortable; they begged me to take them off. I was therefore much interested in seeing the working of these plaster strips in the hands of the most enthusiastic advocates of Michel's method. A visit yesterday to the Presbyterian Eye and Ear Infirmary in Baltimore, showed me that bandages were not altogether discarded (as we were led to believe), and that eyes would get as red and irritable under the plaster as I have ever seen them under the bandage.

And this is another untenable charge made against the bandage by the friends of Dr. Michel's method: that the bandages cause redness and photophobia. It is not the bandage or any other kind of dressing that does it, but it is the different degree of sensitiveness with which different eyes respond to an operation. While one eye opens up fully and shows no redness when the first bandage is taken off, on the second or third day,

another eye shows a moderate injection, and a third one shows a great deal of it, although the operation in all cases was alike. And while one eye may go without any dressing after the third day, I have seen eyes which required a bandage for several weeks, because when it was left off the eye became red, watery and painful, and all these symptoms disappeared as soon as the bandage was reapplied. Mr. Chairman, our forefathers in ophthalmic surgery may have been over-cautious, and enforced restraints (like absolute confinement to a dark room and bed) which are unnecessary; but when we hear people talk as though an eye after an operation required no care, I believe it is time to call a halt to this tendency of going to the opposite extreme. Though I do not doubt that eyes may get well under this loose management, I insist that there are certain indications which must not be neglected, if we wish to call our management a careful and rational one.

DR. J. L. THOMPSON: As to the causation of non-traumatic cataract, many interesting points present themselves. Heredity seems to have a marked influence. I have seen families apparently in robust health, where father or mother has been reported cataractors at a certain age, and where several of the sons and daughters have been operated on for same complaint, where no point of departure from health has been recognized even after careful examination of urine and other suggestive examinations has been made. My records, running over nineteen years, are very full of pencil sketches of incipient cataract. Often have I examined patients for anomalies of refraction, or other eye affection, where no trace whatever of lenticular opacity has been seen, and again in a year or two I have found the periphery or the nucleus slightly clouded. In some of these (the peripheral variety) both lens have been ready for operation in six months, others not in as many years, while others have not changed one particle after the lapse of sixteen years; especially is this the case where the opacity is at the lower inner periphery of the lens. Indeed I have seen hundreds of cases of opacity of this part of the lens which have never advanced after the first deposit or cloudiness.

Why is it that opacity of the lens takes place so often at the lower inner portion? Has gravitation, or lid pressure, or convergence, or efforts of accommodation any thing to do with these phenomena? Another symptom which has frequently arrested my attention while watching the progress of cataract is, congestion of the fundus manifested by floating bodies in the vitreous, and when we have the opportunity of watching these cases to the end often do we see the change from high degrees of hyperopia to the myopic condition. And here we often see the "second sight" of the elderly, again watch

these cases until after the opacity is greater, and the case is almost ready for an operation and the patient can hardly see to go about, when he calls upon us with a beaming countenance, seeing better than for years, the lens having fallen below the pupil. And again, to further astonish me, in one of my patients whom I had watched for years, and in whom I made a preliminary iridectomy five years before owing to a trembling lens, a more remarkable occurrence took place. Not having seen him for several years, he reported one day with the lens substance clear, and nothing but a little dotted capsule left. This occurred several years ago, and he now drives out and does his business with ordinary cataract glasses. So we cannot say cataract is incurable short of operative means. As to bandages, I cannot speak positively. Dr. Knapp, who is extremely careful to bandage his eyes after cataract operation, loses only one case in a hundred, while Dr. Chisolm, who discards bandages, gets about the same result. I think, however, a Providence favors Dr. Chisolm that would not me, for surely a Nemesis would overshadow me were I to try it. Since visiting Dr. Chisolm's Infirmary, a year and a half ago, I have used adhesive strips. I was surprised while there to see the freedom he allowed his cataract patients who were wallowing around on the beds and everywhere.

DR. P. D. KEYSER: There is now no doubt that the choicest and best operation for the extraction of cataract is that without iridectomy, but at the same time it cannot be made in every case. There is one condition in which I invariably make an iridectomy, and that is where the iris fails to respond promptly to light, or reacts sluggishly to atropia. In such cases I have invariably found iritis to follow the simple operation. There are many cases in which it is necessary to make an iridectomy twenty-four or thirty-six hours after the extraction on account of prolapse of the iris. In case of prolapse soon after the operation, iridectomy should not be made at once, for by instilling a drop of eserine solution in the eye every five or ten minutes for a half to one hour, the iris will sometimes be drawn in and the operation avoided. I have found washing out the anterior by means of Wecker's syringe, will remove much of any soft cortical matter remaining behind. In some cases I introduce the nozzle under the iris and wash out behind the iris. Where no iridectomy is made I follow Wecker in using a weak solution of eserine and boric acid in the syringe. The opening of the capsule is a particular point, especially where the iris is not cut. The instruments recommended for removing a piece of the capsule are apt to catch the iris and draw it out without extreme care. I find it impossible to cut a triangular piece out with the cystotome.

When the capsule is slit once the cystotome will not cut across it, but instead it is rolled or dragged back, and in a day or two falls back and closes the opening, requiring a second operation. My best success has been in passing the cystotome through the corneal incision and cutting the capsule across as near the upper periphery under the iris as possible; then turning the instrument with the fleam on the flat, and passing it under the iris opposite the first cut, the point of the fleam is turned downwards, and a straight cut made towards the centre of the first cut, at right angles to it, like an inverted T.

As to bandages, I believe that both eyes should be kept perfectly quiet for twenty-four hours by bandages, and the patient kept in bed for that length of time. I apply a little cotton on the eyes, and a Liebreich bandage for the first day; on the second day I let the unoperated eye out and the patient up. Plasters I do not like, as they are liable to come loose where court plaster is used, or to be painful on removing if adhesive plaster is used, and to cause a spasm of the facial muscles and pressure on the eye, with possibly, opening of the corneal wound. The bandage should be light and merely sufficient to hold the lids in normal apposition.

DR. EUGENE SMITH: "Why do we in simple extraction so often get prolapse?" He attributes it to tilting the knife forward in finishing the section, the upper part of the wound remains open and the aqueous leaks out for some time; but if the section is finished without tilting the knife forward so as to make a flap, the wound more readily closes, and there is less danger of prolapse of the iris. Leaves the mode of dressing to each one's experience. He thinks a little absorbent cotton on the eye held in place by strips of adhesive plaster from the forehead to the cheek very good, but prefers the bandage.

In opening the capsule, the tearing out of the central portion as first suggested by Græfe is difficult with any instrument hitherto constructed. He, however, had devised a forceps for removing a piece of the capsule which worked very nicely. It is like an ordinary iris forceps with the teeth on the lower side, quite long and projecting and extending some distance from the point.

DR. CHISOLM said he made an extraction without iridectomy about a week ago and the corneal wound had not yet healed. The cornea remained perfectly clear and there was no inflammatory reaction whatever about the eye. As to his methods he was only gratified with his present results compared with his former under the old methods.

DR. AYERS now uses adhesive strips exclusively in dressing the eye after extraction. He thinks much depends on their careful application.

He is careful that the strips are not long enough to pass beyond the width of the lids. In this attraction by adjacent muscles, especially of the orbicularis, is obviated.

The extraction is made without the use of speculum, the assistant holding the lids open with his fingers. The decision of the capsule is made before the lids are closed. The lids are then closed for a moment, after opening the eye and directing the patient to turn his eye down and pressure with the point of the index finger or with the curette until the lens presents itself and is completely delivered.

DR. DUDLEY S. REYNOLDS said: I agree with those who are particular to secure a section with beveled edges to favor coaptation in the wound. I am anxious to add my endorsement of the lightest possible dressing without bandage, not to be removed or in any way disturbed for four or five days, unless evidences of irritation occur. As to prolapse of the iris, I have to say it may nearly always be prevented by the free use of eserine in solution before closing the eye.

I would not regard iridectomy as justifiable excepting as stated by Prof. Keyser, where iritis has been present.

DR. SAVAGE: There are, to my mind, two indications for iridectomy in cataract operations. To one of these Dr. Keyser has already referred viz.: when the pupil will not dilate. The other indication is when the cornea is flabby. In this condition, my experience teaches me that if an iridectomy is not done, there will be prolapse in spite of eserine.

DR. RANDALL wished to add his testimony to the importance of treating with alteratives the cases of incipient cataract, as he had seen many cases of prompt cessation of all advance in the cataractous process, which had before seemed rapidly progressive. Opacities are generally first and most markedly seen down and in, because this is the worst part of the choroid, being the most exposed to excess of light. These have not seemed any less apt to advance than spicules in other parts of the lens. The media have become clearer and so remained, and there has been generally little increase of the swelling of the lens, which has at times been previously marked.

DR. MINNEY: In his experience, a fluid vitreous is also an indication for iridectomy, in addition to the one mentioned by Dr. Keyser, of iritis, and the flabby cornea alluded to by Dr. Savage.

BOGUS MEDICAL DIPLOMAS.—The Wisconsin State Medical Board says the Northwest is being flooded with fraudulent medical diplomas, purporting to be issued by the University of Victoria, at Montreal. Fifty of these diplomas have been found in Wisconsin and South Dakota.

THE REFORMED NUMERATION OF PRISMS AND THE CENTRAD AS THE UNIT.

Read in the Section of Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY B. ALEX. RANDALL, A.M., M.D.,

OPHTHALMIC AND AURAL SURGEON TO THE CHILDREN'S HOSPITAL;
PROFESSOR OF OTOTOLOGY IN THE UNIVERSITY OF PENNSYLVANIA
AND THE PHILADELPHIA POLYCLINIC.

About twenty years ago was inaugurated the reform in the numbering of ophthalmological lenses upon the basis of their actual strength as determined by their focal length. Before that time lenses were generally taken at a face value, which represented, in such diverse units of length as were locally employed, the radius of curvature to which each was ground. The reform met opposition on the ground that lenses had to be made by grinding to surfaces of given radii, that the radii gave a sufficiently accurate indication of the focal strength, that there would be large financial loss in abandoning the old system and adopting the new, with its less familiar units—in short, that the change, even if theoretically desirable, involved more practical difficulty than actual advantage. Yet the positive advantages of the reformed system, arising in part from its metric character, but also largely from its acknowledged accuracy of basis, carried it in the face of all opposition; and its acceptance is now nearly universal. It was clearly essential that we should consider lenses from the side of the user, not of the maker; and that we should call for lenses of given strength, and leave to the optician the matter of the refractive index of his material and the radii to which he should grind it. Doubtless lenses were long ground upon old inch moulds, but these have now been trued to metric accuracy or else replaced; and aside from that, it is doubtful if any of the opticians would now elect to go back to the older system.

As with lenses, so too with prisms, the same principle holds good; and it is to be regretted that it was not seen at the time, that their numeration stood in need of the same reform. We use prisms to measure or correct deviations of the optic axes, because they have the property of bending the rays of light passing through them. We employ them to obtain a certain effect—a deviation of the rays of light—and are wholly unconcerned as to how that deviation is secured. In the past we accepted prisms as furnished by the optician, and numbered in accordance with the angle between the two faces—this being the basis upon which they were more or less accurately ground. Only the few took into consideration the actual strength; and these were satisfied with the fact that the deviation produced approximated the half of the refracting angle, just as the radius of curvature gave an approximation

to the strength of a lens. Yet this relation is far from constant for prisms of varying strength, even if accurately ground and of identical material; and in practice the oculist generally depended upon the method of neutralization by means of the prisms of his test-case. Yet, convenient as that method is and will always be, it leaves one entirely at the mercy of the numerous errors which Dr. Jackson has shown to be so common in the test-sets; and we must have, as the basis of our system of prism numbering, a method of exactly measuring the effect—the deviating power—of each prism.

Such a system was proposed by Dr. Edward Jackson, to whom belongs the honor of instituting the reform and demonstrating its necessity. He proposed that prisms be numbered according to the actual deviation in degrees which they cause in a ray of light passing through in the position of minimum deviation. Just as a lens has a varying strength when it is tilted, so has a prism one position—that when the entering and emerging rays make equal angles with its faces—where its deflection is at its least—to increase with any tilting in either direction. This, or some other equally definite position, must be accepted as the one in which the deviating effect shall be measured. So placed, a prism causes a definite angular deviation; and the size of this angle measures the exact strength of the prism. The first and cardinal step in the reform is made in considering this angle only, irrespective of the inclination of the prism faces or the refractive index of its material.

The reform is too evidently desirable to need argument in its behalf. It is accurate in principle and in fact, where our old system was gravely faulty. Against it can only be argued that the errors of our present numbering are of small practical importance, and that there are difficulties in introducing the new system. As to the sufficient approximation of the numeration now in vogue, Dr. Jackson has shown that at no point do the prisms in common use accurately give a deviation equal to one-half of the refracting angle, but that, beginning with a value of 0.54° actual deviation for the 1° prism (placed with one face perpendicular to the incident ray), the deviation increases more rapidly than the refracting angle until, at about 40° , they become equal—a 40° prism gives a little more than 40° of deviation. Beyond this, any small increase in the refracting angle gives a much greater deviation, until at 41.48° the "critical angle" is reached, and the deflected ray no longer emerges from the prism. Infinitesimal differences in the index or the refracting angle here greatly change the power of the prism. This condition is less quickly reached when the measurement is made in the position of minimum deviation; and it is only at 81° that deviation and refracting angle become

equal. Yet the fact holds good that the angle between the faces of the prism gives but a variable and indirect suggestion of its deviating strength—two 10° prisms do not equal a 20°, and it would take eight of them to equal a 40° prism. The deviating effect of the prism—the strength which it has to fulfil our uses—furnishes us with the rational basis for our enumeration.

TABLE SHOWING THE VALUE AND RELATIONS OF CENTRADS.

Centrads.	Arc or Angle.	Tangent (P. D.)	Ref. Angle (Index 1.54).
1.	0°.57295 plus	1.	1°.06
2.	1°.14590	2.0001	2°.12
3.	1°.71885	3.0013	3°.18
4.	2°.29180	4.0028	4°.23
5.	2°.86475	5.0045	5°.28
6.	3°.43770	6.0063	6°.32
7.	4°.01065	7.0115	7°.35
8.	4°.58360	8.0172	8°.38
9.	5°.15655	9.0244	9°.39
10.	5°.72950	10.033	10°.39
11.	6°.30245	11.044	11°.37
12.	6°.87540	12.057	12°.34
13.	7°.44835	13.074	13°.29
14.	8°.02130	14.092	14°.23
15.	8°.59425	15.114	15°.16
16.	9°.16720	16.138	16°.08
17.	9°.74015	17.164	16°.98
18.	10°.31310	18.196	17°.85
19.	10°.88605	19.230	18°.68
20.	11°.45900	20.270	19°.45
25.	14°.32375	25.55	23°.43
30.	17°.18850	30.934	26°.81
35.	20°.05325	36.50	29°.72
40.	22°.91800	42.28	32°.18
45.	25°.78275	48.30	34°.20
50.	28°.6475	54.514	35°.94
60.	34°.3770	68.43	38°.31
70.	40°.1065	84.22	39°.73
80.	45°.8360	102.96	40°.29
90.	51°.5655	126.01	40°.49
100.	57°.295 plus.	155.75	39°.14

TABLE OF METER ANGLES IN CENTRADS AND PRISM DIOPTRES.

Inter-ocular distance = 50 mm.			Inter-ocular distance = 60 mm.			Inter-ocular distance = 64 mm.		
M. Ang.	Centrads	Min. P.-D.	Centrads	Min. P.-D.	Dev.	Centrads	Min. P.-D.	Dev.
1	2.5004	2.502	3.000	3.0012		3.2006	3.2017	
2	5.003	5.008	6.004	6.010		6.404	6.413	
3	7.509	7.519				9.61	9.644	
4	10.020	10.059				12.83	12.096	
5	12.535	12.603	15.05	15.17		16.06	16.208	
6	15.06	15.18				20.39	20.97	
7	17.19	17.77				25.88	26.48	
8	20.20	20.41				29.21	30.07	
9	22.69	23.09				32.55	33.77	
10	25.74	26.81	30.47	31.45		39.41	40.64	
12	30.09	30.97				46.45	50.12	
14	35.76	37.36				53.73	59.60	
16	41.15	43.65				61.38	70.38	
18	46.68	50.95				69.45	83.29	
20	52.36	57.75	64.35	75.0				

Our designation of prisms by the amount of deviation brings in the need of a new nomenclature. "Degrees" of prism have always in the past expressed the size of the refracting angle—"actual deviation" must now be expressed if we use degrees to indicate the *strength* instead of the *shape*, and the position of the prism must be specified. Accordingly, Dr. Jackson proposed that we measure in the position of minimum deviation, and add a small *d* to the number to indicate this. The system has advantages, and is upheld by Landolt as the best; yet the minimum deviation is not very convenient to measure pre-

cisely, such a mounting of our prisms would be inconvenient in our test-frames, and all computations are simpler if the entire refraction takes place at one surface. There would be inevitable confusion, also, between the old system and the new, since both use "degrees," yet mean very different things by that term.

The second step, suggested by Dr. Wm. S. Dennett, was very important, therefore, since it removed these difficulties. He proposed as a working unit a prism deflecting (through an angle subtended by an arc 0.01 the length of the radius) the ray of light falling perpendicular to one of its faces. This is the "centrad." The mathematicians, in seeking a better unit of arc and angle than the degree, have adopted the "radian"—an arc equal to the radius—and 0.01 of this is the "centiradian" which subtends the centrad. The new unit is distinct in name, in accord with advanced mathematics, and also—very important for its practical adoption—it is almost precisely the strength which we ought to obtain from a prism of 1° refracting angle. If made of light flint glass instead of the usual crown glass, the equivalence would be exact for the smaller numbers, and the symbol Cr. instead of Pr. will be the only difference to mark the use of actual values in the place of the nominal.

A further step in commending the reformed system was made by Mr. Chas F. Prentice, in advocating a similar unit. His "prism-dioptre" deviates the ray of light through one one-hundredth of the radius as measured on the tangent instead of the arc, and for low values is identical with the centrad in strength. He has shown that, within narrow limits, it has relations at once simple and of great importance to the valuable "meter-angle" and to the decentering of lenses. In any given case one-half the inter-ocular distance in centimeters closely approximates "prism dioptres" or centrads the value of one meter-angle. Thus for inter-ocular width of 50 mm. the meter-angle is equal to 2.50 P-D. or Cr. Yet the relation can be but an approximation, since one-half the inter-pupillary distance equals the sine of the meter-angle, not the angle itself; while the "prism-dioptre," being a tangent-measure can represent neither precisely, and within practical limits the discrepancy is considerable. Thus for 7 cm. between the eyes, 5 M.a. equals 17.76 P-D. instead of 17.5. Ten M.a. would be 37.36 and 20 M.a. 98 P-D. instead of 35 and 70, respectively. Conversely 35 P-D. would represent 9.45 M.a., not 10. The centrad values are distinctly more close an approximation. For 7 cm. between the eyes 10 M.a. equals 35.74 Cr. instead of the even 35 and 20 M.a. equals 77.88 Cr. It must not be forgotten, however, that in this later case 35.74 and 77.88 are the accurate expressions in "radian" or "arcual" nomenclature of the values of

0 and 20 M.a. respectively—the discrepancy is here due to the inaccuracy of the convenient assumption that the meter-angle is *directly* expressed by the inter-ocular distance.

Mr. Prentice has also pointed out that in the decentering of lenses, the dioptric-strength of the lens multiplied into the centimeters of decentering gives the prismatic effect in "prism-dioptres." This is theoretically accurate, except for spherical aberration—in fact a 20 D. lens decentered 1 cm. (an extreme case, practically) gives 20 Cr. or 20.27 P.D. of deviation.

Such then are the main points in favor of the reformed numeration of prisms: the question is then as to which is the best of the systems proposed, or whether a further improvement can be made. Of the two simplest positions of the prism that in which all refraction takes place at one surface seems the more practical and simple, although the minimum deviation is easier to measure off-hand and permits the use of a wider series of prisms. An instrument of precision to measure the minimum deviation could be easily constructed and graduated to read in degrees or centiradians or tangent-centimeters. The prism-dioptre may be slightly easier to measure, since any wall laid off in even centimeters forms a ready prismometer. Yet the centrad is as easily and accurately measured by improvised or special apparatus, is in full accord with our received methods of noting deviation in terms of arc or angle, is more directly comparable and convertible, and finally, gives the closest approximation in the direct determination of the meter-angle and the prismatic effect of decentered lenses.

complicated apparatus is necessary, though for the finer determinations and for certain combinations of sphero-and cylindro-prisms the elegant instrument of Mr. Prentice is essential. It brings itself into harmony with the so-called meter angle and enables us to estimate the amount and power of convergence by a simple measurement of the inter-pupillary distance with an accuracy that is sufficient for all practical purposes, and, by the same or less amount of calculation than is necessary with the centrad or the present system, with perfect accuracy. It enables us to find the prismatic action of decentered spherical and cylindrical lenses with great exactness and with remarkable ease; one centimeter of decentration giving as many prism dioptries as the lens has dioptries of refraction. It enables us to measure the power of a prism combined with a spherical or a cylindrical lens more easily and readily than by any other method, and brings our lenses and prisms together upon the same basis of a uniform standard measurement distance of one meter.

In fine, the prism dioptry in accuracy, simplicity, ease of determination and width of application fulfills all requirements and leaves nothing to be desired as a method of numbering prisms. On the other hand the centrad, or centirad, as some prefer to call it,—is artificial, its principle is not recognized in optics, except by a few specialists in England, and it can serve no purpose that is not already served by the degree. It is based upon an angle corresponding to an arc equal to the radius, which is called a radian, and is equal to $0.57295^\circ +$. The .01 ($\frac{1}{100}$) of this is called a centrad and is proposed as a unit for prism measurement, and it was so proposed by Dr. Dennett, the originator of the scheme, because he says: if you use glass with an index of 1.57233 one centrad will equal 1° . (As a matter of fact this is not strictly so, as his table shows). This unit, please observe, is angular and nothing else was originally claimed for it, and, therefore, as a unit, the same objections are to be urged against it as against the minimum angle of deviation, with many additional on its own account.

Dr. Randall has said, in a discussion of this question, that we cannot get away from angles in the deflection of prisms. That is true in a certain sense, but the centrad departs farther from the angle as universally regarded in mathematics to-day than any other proposed method. Dr. Randall actually proposes, in his enthusiasm for the centrad, to do away with degrees altogether and abolish one of the fundamental units of optical science, one which forms an essential part of the great and enduring works of Helmholtz, Gauss and the numberless others who have made optics, technical and physiological, what it is.

Enthusiasm is good, but let us keep it within the bounds of sanity. Now the prism dioptry does not propose to abolish anything that is ex-

THE PRISM-DIOPTRY VS. THE CENTRAD.

Read in the Section of Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY SWAN M. BURNETT, M.D., PH.D.,
OF WASHINGTON, D. C.

I have had occasion to remark before, in respect to this question, that what we need in the nomenclature of prisms is scientific accuracy, readiness and simplicity of practical application with as little innovation in established custom as possible. The prism-dioptry, I believe, fulfills all these requirements. It takes as a standard prism one which causes a deflection of 1 cm. on a plane at one meter's distance, which is nearly what is now known as a one degree prism, and will thus entail no change in the present process of manufacture or in the plant of the manufacturers. It is scientific and accurate, every prism being precisely what its number indicates, and its power can be measured by any one having a centimeter rule and a meter measure. No

instant and in general use; it proposes no revolution. It keeps degrees, minutes, seconds, signs and tangents just where they were, and you can find the value of any number of prism dioptries in those reciprocals if you should happen to want them. Suppose, for instance, you wish to find the sign or tangent of three centrad, you have first to multiply $.57295 +$ by 3, convert this result into degrees, minutes and seconds and then find their reciprocal sign or tangent in the table. This difference is much magnified when it comes to the application of the centrad to the meter angle, particularly if high degrees are used, for the difference between the centrad and the angle increases very much as the higher numbers are reached, not as much, however, it must be said, as between the prism dioptry and the angle, but the value in angles, of the prism dioptry, considered as a tangent, is much more easily found than that of the centrad. But, after all, the convergence need not necessarily be expressed in values of angles for any practical purpose. It can be expressed more simply and easily in prism dioptries. If absolute angles are wanted, as they never will be, since the error falls much within the limits of the personal equation, that accuracy is, as we have said, easily obtained. It is nonsense to speak of 20 meter angles, as is sometimes done, in illustration. Twenty M.a. means a convergence of five centimeters and that can never be used, and if it is applied to a deficiency of the convergence (negative), it is a condition that should not be corrected by prisms, but by operation.

In fact, all the anomalies known under the name of muscular insufficiencies can be most readily reckoned by means of the prism dioptry. In making examination for heterophonia, I employ the following simple methods. On the black wall of my ophthalmoscopic chamber I have ruled a number of squares in white lines 6 cm. apart. The flame of an argand burner, turned somewhat low, is brought to a point opposite the crossing of two of these lines at the center of the system of squares. In producing the diplopia I do not use a prism or a maddox rod, but take a 6D cylinder from the trial case, and place it before one eye of the patient, who is 6 meters from the light. By causing the patient to look near one of the curved edges of the lens we get the prismatic action of the cylinder in the form of a broad streak of light projected above or below the argand flame in examining for exophosia and esophosia. This causes no lateral deviation whatever, even when the lens is tilted. It should be turned, however, until the broad light streak is perfectly vertical and if there is any deviation to the right or left from the line on which the argand light rests, the distance is noted in the number of squares—each one of which corresponds 1 P.D. at the distance of 6 m. We are

then able to tell at a glance almost the character of the heterophonia and its amount expressed in prism-dioptrie.

In practice it is not the custom to use prisms stronger than 4 P.D. for a single eye, and I challenge Dr. Randall to detect the difference between the deflection of a 4 P.D. prism of one centimeter on the arc and on the plane. The difference cannot be measured by any means we have at our command. By all means let us be as accurate as we can, but let us not go outside the limits of reason and practicability; and while straining at this gnat of a purely theoretical, almost imaginary error, let us not swallow the camel of a new system which will necessitate the unlearning of a great deal that we have been taught, and which strikes at the foundation of our whole system of optics and leaves us practically none the better off.

After all is said, that which gives the centrad system any semblance of virtue and assures it any claim for acceptance has been taken bodily from the prism-dioptry. They say that one can measure the deflection on an arc at one meter, or at any chosen distance. But did any of the advocates say that before Mr. Prentice, with what seems like a flash of genius, put forth the simple idea of taking the linear deflection as a measure of the prism and adopting as a unit one having one centimeter deflection at a meter's distance? Take the deflection measurement away from the centrad and it has no advantage over the minimum angle and has many disadvantages which the angle has not.

It would be absurd to suppose that a man of the profound mathematical knowledge of Mr. Prentice had not thought of measuring this deflection on the arc. The fact is that was one of the things he wanted to get rid of in his effort at reducing the measurement to the simplest conditions possible. We have planes everywhere, but a different arc must be constructed for every distance. The purpose of the prism-dioptry in its inception was to offer to the optician and to the busy practitioner a method of measuring the power of the prisms used in ophthalmology that should be simple, accurate, readily practiced, with as little change in our present methods as possible, and should bring it into harmony with the accepted notation of lenses, the meter angle and the decentering of lenses. In doing this I think it has been marvellously successful. On the other hand the proposed centrad system asks us to abandon one of the established units in optics, to adopt a system which is not used in our ordinary text books on optical science, and to unlearn much that we have already acquired through the labors of our great teachers in mathematical optics, and which cannot be made useful in the decentering of lenses or in measuring prisms combined with lenses and, only by twist-

ing, can be made applicable to measuring the meter angle. The centrad, as now advocated, is the prism-dioptry with the exception that the deflection of the centrad is measured on the arc, that of the prism-dioptry on a plane. The difference between these for practical purposes, is infinitesimal.

It is the law laid down in all treatises on optics from Gauss to the present time that we are to consider the arc, sign and tangent in all calculations where lenses are concerned as the same. If these masters in science who, by the adoption of this principle, have made technical optics possible, can do this we certainly cannot err in adopting it. In fact we cannot ignore it if we would not throw ourselves out of line with all previous investigation and study.

You have the two systems before you; one simple, scientific, easily executed and in keeping with all previous work, the other entirely new, revolutionary, requiring special apparatus for its use and with its only commendable feature taken from the prism-dioptry.

DISCUSSION.

DR. DUDLEY S. REYNOLDS said that he regarded it a very important matter to have some established basis for the measurement of prisms. It was desirable also to have as accurate values as possible, and this system of the centrad he considered comes nearest it. He acknowledged that there was a very small difference between the centrad and the refracting angle, but the former is more absolutely accurate. The difference, while almost infinitesimal, is at the same time real and it is the principle, scientifically considered, that caused him to advocate the centrad system. In adopting a new system it should be as accurate as possible. The centrad is not new, however, having been used in science many years. It is essential in circular measure that there be angles, nor can they be done away with.

As to centering lenses, he has demonstrated that the decentering by displacing is measured by the centrads and not by prism-dioptrics.

DR. RANDALL said in closing, that he had laid most stress on the reform rather than the relative values of the prism dioptré and centrad. That he had already brought out in *The Med. News* of April 4th. His paper was a plea for accuracy, as rigid as possible, and he had demonstrated by the figures presented, that while the two units were generally identical, there were distinct differences even within the common practical limits and always in favor of the centrad. Our reform should introduce the minimum of change and the centrad changed only the unit, while the prism-dioptre changes both the unit and the method. As to the name, he feared that "prism-dioptres" would force "lens dioptrés" upon us; and we were likely to lose rather than gain in clearness, when

each 1, 2, 3, 4, or 5 dioptrés of accommodation, was stated to be accompanied by some 3, 6, 9, 12 or 15 P.D. of convergence.

The Congress of American Physicians and Surgeons.

Dr. Samuel S. Adams, of 1632 K. Street, Washington, D. C., has issued the following circular, dated August 8: I inclose herewith, for your information, a memorandum with regard to reduction of railroad fares for those attending the Second Congress of American Physicians and Surgeons. You will see from this that, to enable any member to obtain the reduction, there must be present at least one hundred persons holding special certificates. Will you, therefore, please notify me, without delay, as to whether you intend to avail yourself of this method of obtaining reduction in fare, and also whether you will be accompanied by any members of your family who will also desire to avail themselves of such reduction? Early in September the committee will inform you, by circular, as to whether one hundred persons or more have sent notice that they will avail themselves of this method of obtaining reduction, and will obtain special certificates for the purpose. In case there should not be one hundred persons who indicate their intention of doing this, only the ordinary reduction of rates on round-trip excursion tickets can be obtained by those coming to the Congress.

Reduction in Railroad Fares.—The Trunk Lines, the New York and Boston lines, the Southern Passenger Association and the Central Traffic Association, will transport persons from points on their lines to Washington and return, at the price of one and one-third the regular fare, on the following conditions: 1. There must be an attendance at the meeting of not less than one hundred persons holding special certificates. 2. The going ticket must be purchased within three days before the opening date of the meeting. 3. Each person availing himself of the concession must pay full first-class fare going to the meeting, and must obtain a certificate from the agent of whom the ticket is purchased. 4. Those holding such certificates, when countersigned by the proper officer at the Congress, can obtain return tickets at one-third the highest limited fare. *Certificates are not transferable, and the return tickets secured upon certificates are not transferable. If any of them are sold or transferred, they must be redeemed at the highest first-class rate by the person making such sale or transfer.* No refund of fare will be made on account of any person failing to obtain a certificate. Those who wish to avail themselves of this method of obtaining reduction in fares should present themselves at the office for certificates and tickets at least thirty minutes be-

fore departure of trains. It is absolutely necessary for each passenger, before starting, to obtain a certificate from the ticket agent of whom the going ticket is purchased, otherwise he can obtain no reduction in the return fare. There will be no stop-over privileges on the return tickets, which must always be by the same route as the going ticket. Members may obtain tickets on these conditions for their wives and members of their families, as well as themselves. Following is a list of the roads making these concessions:

Trunk Line Passenger Committee.—Reduction in Fare on Certificate Plan.—1. The reduction is to persons going to the meeting from Trunk Line territory—*i. e.*, from Niagara Falls, Buffalo, and Salamanca, N. Y., Pittsburgh, Pa., Bellaire, O., Wheeling, Parkersburg, and Charleston, W. Va., and points east thereof, except in New England. *List of Roads making the Concession:* Addison & Pennsylvania, Allegheny Valley, Baltimore & Ohio (Parkersburg, Bellaire, and Wheeling, and east thereof), Baltimore and Potomac, ¹Bennington & Rutland, Buffalo, Rochester, & Pittsburgh, Camden & Atlantic, Central of New Jersey (except locally between Philadelphia and New York), ¹Central Vermont, Chesapeake & Ohio (east of Charleston, W. Va.), Cumberland Valley, Delaware & Hudson Canal Co., Delaware, Lackawanna, & Western, Elmira, Cortland, & Northern, Fall Brook Coal Co., ¹Fitchburg, ¹Grand Trunk, Lehigh Valley, New York Central & Hudson River, New York, Lake Erie & Western (east of Salamanca and Buffalo), New York, ¹Ontario & Western, New York, Philadelphia, & Norfolk, Northern Central, Pennsylvania (except locally between Philadelphia and New York), Philadelphia & Erie, Philadelphia & Reading (except locally between Philadelphia and New York), Philadelphia, Wilmington, & Baltimore, Rome, Watertown, & Ogdensburg (except on Phoenix Line—stations between Syracuse and Oswego), Western New York & Pennsylvania, West Jersey, West Shore.

New York and Boston Lines Passenger Committee.—List of Lines making the Concession, and Points thereon from which it applies: Boston & Albany R. R., New York & New England R. R., New York, New Haven, & Hartford R. R., New York, Providence, & Boston R. R., Old Colony Railroad, Fall River Line, Norwich Line, Providence Line, Stonington Line.

Southern Passenger Association, composed of the following companies: Alabama Great Southern Railroad, Atlantic Coast Line, Atlantic & West Point Railroad, Brunswick & Western Railroad, Charleston and Savannah Railway, Central Railroad of Georgia, Cincinnati, New Orleans, & Texas Pacific Railway, East Tennessee, Virginia, & Georgia Railway, Georgia Railroad, Georgia

Pacific Railway, Illinois Central Railroad; (*Lines South of the Ohio River*) Jacksonville, Tampa, & Key West Railway, Louisville & Nashville Railroad; (*Lines South of the Ohio River*) Louisville, New Orleans, & Texas Railway, Mississippi & Tennessee Railroad, Mobile & Ohio Railroad; (*Lines South of the Ohio River*) Memphis and Charleston Railroad, Nashville, Chattanooga, & St. Louis Railway, New Orleans & Northeastern Railroad, Norfolk & Western Railroad, Pennsylvania Railroad; (*Lines South of Washington*) Port Royal & Augusta Railway, Raleigh & Gaston Railroad, Richmond & Alleghany Railroad, Richmond & Danville Railroad, Richmond, Fredericksburg, & Potomac Railroad, Rome Railroad, Savannah, Florida, & Western Railway, Seaboard & Roanoke Railroad, Shenandoah Valley Railroad; (*Lines South of Potomac River*) South Carolina Railway, Vicksburg and Meridian Railroad, Western & Atlantic Railroad, Western Railway of Alabama.

Central Traffic Association.—The territory of the Central Traffic Association is bounded on the east by Pittsburgh, Salamanca, Buffalo, and Toronto; on the north by the line of and including points on the Grand Trunk Railway, from Toronto to Port Huron, thence via Lake Huron and Michigan to the north line of Cook County, Illinois; on the west by the west line of Cook County and the Illinois and Mississippi Rivers to Cairo, including Burlington, Keokuk, Quincy, Hannibal, and St. Louis; and on the south by the Ohio River, but including points on either side of that river.

AMERICAN RHINOLOGICAL ASSOCIATION.—The ninth Annual Meeting of the Association will be held in Indianapolis, Ind., October 6, 7 and 8. The meeting promises to be an interesting one. Papers are promised, among others, as follows: "Nasal Stenosis from Inflammatory Action," by Dr. Christopher, St. Joseph, Mo. "The Abuse of the Galvano-Cautery in the Treatment of Diseases of the Ear, Nose and Throat," by Dr. Cheatham, Louisville, Ky; "Sarcoma of the Nasal and Pharyngo-Nasal Cavities," by Dr. Reinbold, St. Louis, Mo.; "The Voice Treatment of the Nose and Throat," by Dr. Hobbs, Atlanta, Ga.; "Surgery of the Nasal Forsæ," by Dr. North, Toledo, O.; "When Ante and when Post-Nasal Catarrh," by Dr. von Klein, Cleveland, O. Other papers are promised and some from applicants for fellowship in the Association.

President, Dr. R. S. Knode, Omaha, Neb., Secretary, Dr. E. R. Lewis, Indianapolis, Ind. Inquiries may be addressed to either of the above officers.

ARISTOL IN IVY POISONING.—Dr. J. J. Levick reports a case in which severe poisoning from rhus toxicodendron was promptly much relieved by the free dusting of powdered aristol on the affected parts.

¹ Only for business originating at, or destined to, stations on the direct lines of these roads between Troy, N. Y., and Montreal, Can.

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MEMBERSHIP IN THE AMERICAN MEDICAL ASSOCIATION.

This is obtainable, at any time, by a member of any State or local Medical Society which is entitled to send delegates to the Association. All that is necessary is for the applicant to write to the Treasurer of the Association, Dr. Richard J. Dunglison, Lock Box 1274, Philadelphia, Pa., sending him a certificate or statement that he is in good standing in his own Society, signed by the President and Secretary of said Society, with five dollars for annual dues. Attendance as a delegate at an annual meeting of the Association is not necessary to obtain membership. On receipt of the above amount the weekly JOURNAL of the Association will be forwarded regularly.

SATURDAY, AUGUST 29, 1891.

LINEAR CRANIOTOMY.

At the meeting of the Association last May, KEEN, of Philadelphia, read a paper on this subject, which appeared in a recent number of THE JOURNAL. DR. KEEN very properly objects to the term craniectomy, originally proposed by LANNELONGUE, and suggests instead linear craniotomy. The operation consists essentially of an incision through the cranium, usually parallel to the sagittal suture, but not necessarily so. KEEN reports eight cases, three of which he operated, two by LANNELONGUE, and one each by GERSTER and SACHS, WYETH, and MCCLINTOCK. GERSTER and SACHS's case and one of KEEN's died shortly after the operation. In WYETH's case the operation was quite different from that ordinarily done. He made two incisions through the skull, $\frac{3}{4}$ of an inch apart, and extending from a point just above the eyes to the occipital protuberance. Lateral incisions were then made at each end of these incisions, and also in the middle, and the four flaps of bone thus formed were forcibly torn apart, widening the original incisions by $\frac{3}{4}$ of an inch. The result in this case was satisfactory.

At the meeting, early in April, of the Fifth French Surgical Congress, LANNELONGUE reviewed this subject, basing his remarks on twenty-five operations.¹ LANNELONGUE finds an in-

dication for linear craniotomy in a number of other conditions besides microcephalism, with its premature closing of the sutures. In the so-called obstetrical compression, whether occurring during birth, or as the result of intra-uterine pressure during gestation, the operation appears to be indicated. Meningeal hæmorrhage in young subjects, circumscribed pachymeningitis, serous cysts, hyperostoses due to hereditary syphilis, certain forms of hydrocephalus, accompanied with thickening of the bones and premature closing of the sutures and fontanelles, all point to linear craniotomy as the proper mode of relief.

LANNELONGUE makes two operations, the "linear craniectomy," as he continues to term it, and "*craniectomie à lambeaux*." Besides the form already described, LANNELONGUE has made a transverse craniotomy in the frontal bone, and in the occipital bone. The "*craniectomie à lambeaux*," or flap craniotomy, consists in running the incisions so as to leave variously shaped bony flaps, after the manner of WYETH's operation, already referred to. This is the operation which LANNELONGUE is more and more frequently performing. Sometimes the flap includes a single bone, as the frontal or parietal, sometimes portions of two bones. The incisions are made in the shape of a T, a V, a U, a rectangle, or a horseshoe. As to the periosteum, the results are the same, whether it be resected or not. If the dura mater be cut, it should be sutured. The danger from hæmorrhage is unimportant; the meningeal artery and its branches are uncovered without danger. Great thickness of the cranium, hyperostosis, eburnation of the bone, present no difficulties.

In twenty-five operations he reports twenty-four operative successes, one death in 48 hours from acute septicæmia or loss of cephalo-rachidian fluid. Three times suppuration occurred, the longest duration being three weeks. No necrosis was seen. The youngest child was 8 months, and the oldest 12½ years. As to symptomatic results, he says that a very great number of the little patients have been improved either in intelligence or ability to walk.

In the discussion which followed, ANGER reported a case in a girl of 8 years, who was much improved. LARABRIC reported an operation by HEURTAUX on a child of 5 months, who died two months later without having shown any improve-

¹ Revue mensuelle des Maladies de l'Enfance, May, 1891.

ment. A most important case was reported by MANOURY, of Chartres, October 20, 1890; he made the linear operation on a four year old microcephalic girl who had never been able to walk or stand, who had double talipes equinus, who constantly moved the upper extremities, and who never pronounced a single syllable and was unable to chew her food. Immediately after the operation, the movements ceased, the talipes disappeared, the head was held up; and the face became more intelligent. The child chewed its food and was able to stand. This condition continued for two or three months, when gradually all the former troubles returned. Measurements of the head before and after the operation revealed no differences in size. The same operator reported a fatal case in a child of two years, death occurring by convulsions, twenty hours after the operation.

The latest American case reported seems to be that of DR. WM. H. MORRISON of Philadelphia, who successfully operated on a boy $2\frac{1}{2}$ years old, April 17, 1891.²

It is too early to derive conclusions from the operations reported, but it seems that the operation *per se* is not particularly dangerous and even if only occasional permanent good results are obtained, the operation should be made. No more pitiable objects exist than the unfortunate victims of microcephalism, with their idiocy, their paralyses, their general mental and physical incompetence, and they are certainly entitled to anything which may offer some prospect of relief. Education offers but little hope, and we have no other treatment at our disposal, so that the performance of craniotomy is not only justifiable, but a duty in these cases. With a view to the relief of certain cortical centers, it is possible that in individual cases the particular location of the incisions may be determined by the symptoms present.

THE USE OF MENTHOL IN PRURITUS.

Menthol has been found useful in the summer irritations of the skin, including those following the bites of mosquitoes, fleas and other insects. One part of menthol added to eight or ten parts of alcohol, or cologne water, will relieve not a few persons, but not all; at all events it is a pleasantly soothing and cooling application.

Some forms of head-ache, or brow-ache, are speedily relieved by the lotion containing one part in ten of menthol, the same being applied by rubbing, over the forehead and temples, with the hand or dampened muslin. Mixtures of menthol in glycerine and water have been commended for like purposes, but are not so suitable as the lotion above mentioned for use about the face, head and hands.

THE RELATION OF FUNCTIONAL DISORDERS OF THE HEART TO DISEASES OF THE ABDOMINAL VISCERA.

Under the above title DR. SEYMOUR TAYLOR presents a suggestive paper in the July number of *The Practitioner*. The matter is purely clinical, unaccompanied in any case reported by post-mortem examination, which is to be regretted, although to be commended as a report of careful clinical observation, after the manner of our forefathers, a habit altogether too much in disuse at present. The term "functional heart disorder" he uses in the sense as disturbed cardiac action in the absence of disease of the valves or muscular walls of the heart. He notes three cases of tachycardia, or heart hurry, and twelve of bradycardia, or slowness of pulse. The cases of tachycardia were characterized by suddenness of onset, being excited by such slight causes as a sudden noise, or mental emotion. The attacks would terminate with equal suddenness. Dangerous syncope was frequently present and two of the cases died during an attack.

In one of the cases, the pulse rate reached 200, and in another 270 per minute. The only discoverable structural lesions were in one case, a movable kidney, in another a large uterine tumor, and retroversion, and in the third enlarged prostate with chronic cystitis.

ORD has distinctly shown that a reflex destructive or dystrophic change occurs in the skin and joints secondary to uterine, or prostatic or urethral disease. Assuming a causal reflex nervous influence, TAYLOR thinks that the original irritation from the abdominal or pelvic disease may act higher in the cord and be reflected to the cord causing a motor disturbance.

Of the twelve cases of slow or intermittent heart action, three occurred after enteric fever, five in cases of chronic bladder and prostatic trouble, three had chronic bowel trouble, and in

² Medical Record, July 18, 1891.

one, pregnancy was the abdominal trouble. A diminished pulse rate and subnormal temperature are not uncommon after typhoid fever.

The cases cited are by no means proof of a causal relation between abdominal lesion and functional heart trouble, nor is it clear that the effects of nutritional disturbances, or of cardiac obesity have been eliminated, yet still they make it desirable that possible connections of this type should be more closely noted.

ON THE VALIDITY OF STATISTICAL PROOF IN MEDICINE.

The following axiomatic statement occurs at the head of a book review in a recent number of the *Lancet*: "The true and sufficient reply to the oft-quoted allegation that one can prove anything by statistics is that without them one can prove nothing." This is putting the case in strong language, to say the least, and yet there is so much in it of rebuke to those who would belittle the authority of statistical statement that we would be glad if we could give emphasis to the quoted paragraph, with the name of its acute composer. When we reflect how much in the past history of scientific medicine has been due to the master in statistics, and how much in future must depend upon him, we stand ready to honor the philosopher who could indite so clear and righteous a decree.

THE MEDICAL BUREAU OF THE COLUMBIAN EXPOSITION.

This very necessary adjunct to the great Fair was organized June 1, 1891. Staff: Jno. E. Owens, M.D., Medical Director; W. H. Allport, N. R. Yeager, S. C. Plummer, Assistant Surgeons.

The Bureau took charge of medical, surgical, and sanitary inspection work on the grounds July 1, 1891, and is now in active operation.

A temporary dispensary and emergency hospital has been constructed, where medical and surgical attendance and medicines are furnished to employes during the day free of charge.

The Bureau is amply equipped with instruments, medicines, operating room furniture, stretchers, cots, and an orderly. The City Police Department has furnished a patrol wagon for ambulance service to be used until a perma-

nent ambulance has been constructed, and the Exposition company provides horses, harness and driver.

The present Bureau operating during the construction period will be the nucleus of the medical service of the World's Fair. It is the intention of the Medical Director to make the records of the Bureau as complete as possible from a statistical and historical standpoint, and to furnish at the close of the service a report which will be valuable in the organizations of the Medical Bureaus of future Expositions.

Present number of persons living or working on the grounds is 2,000, increasing weekly. Several accidents have already occurred, and the Bureau has had ample opportunity to demonstrate its right to existence.

NECROLOGY.

Richard Lea McDonell, M.D.

Dr. Richard Lea McDonell, of Montreal, died July 31, aged thirty-eight years. He was professor of clinical medicine at McGill University and physician to the Montreal General Hospital. He was the son of an accomplished physician from whom he inherited fine intellectual powers and an unquenchable fondness for medicine. He was one of the best and most popular among the junior professors in the University, being notable for his punctuality and careful preparation as well as for his fine literary capacity and a ready diction. He was active in the medical societies and with his pen in both American and English periodicals. About two years ago he was taken with a severe pulmonary hæmorrhage, which impelled him to give up his professional work for a year, and to travel in Europe. He spent most of this time among the Alps, and his health was so far improved that there appeared to be an arrest of the disease. He resumed work, and during the last session of the college was in vigorous health, and so continued until a few weeks since. But his pulmonary troubles returned and advanced rapidly during July, carrying him off in the prime of life, a sacrifice to tubercular phthisis.

John Joseph Cochran, M.D.

Surgeon John Joseph Cochran, U. S. A., died August 6, at the St. Luke's Hospital, New York City. He was a native of Cambridge, Mass., from which State he was appointed to the Army about ten years ago. He was an alumnus of the College of Physicians and Surgeons, New York, of the class of 1876, and for a short time served as surgeon on one of the Cunard liners, directly after his graduation. He attained to the grade of captain in 1885. His fatal illness was typhoid fever.

BOOK REVIEWS.

A TEXT-BOOK OF THE DISEASES OF THE EAR.
By DR. JOSEF GRUBER, Professor of Otology in the Imperial Royal University of Vienna, etc. Translated from the second German Edition, by special permission of the Author, and edited by Edward Law, M.D., C.M., Edin., M.R.C.S., Eng., Surgeon to the London Throat Hospital for Diseases of the Throat, Nose and Ear, and by Coleman Jewell, M.B., London, M.R.C.S., Eng., late Physician to the London Throat Hospital. With 150 Illustrations and Seventy Colored Figures on two Lithographic Plates. New York: D. Appleton & Co., 1, 3 and 5 Bond St. 1890. Compliments A. C. McClurg & Co., 117-121 Wabash Ave., Chicago. Price \$5.00.

Those who are specially interested in the study of diseases of the ear and their treatment, will recognize the thoroughly helpful work which has been accomplished by Professor Gruber. Himself a self-taught man, he has not forgotten the successive steps of progress by which he has attained his present eminence as a practitioner and teacher, and from his personal experience, he is the better able to conduct his students along the ways now so familiar to him. His English editor, Professor Law, his former pupil, assisted at the first by the late Dr. Coleman Jewell, appreciating the value of the work, has given to the English-speaking people a fine translation of the same, and the publishing house of D. Appleton & Co., New York, have placed upon the American market an exceptionally fine edition of this excellent work.

Recognizing the absolute importance of a critical knowledge of the anatomical structure of the parts which, directly or indirectly, may be involved in diseases of the ear, the author has performed this part of his work in a most creditable manner. In the present edition, it has been submitted to the able supervision of Dr. Howden, Lecturer on Anatomy in the University of Durham College of Medicine, and the thoroughness with which his work is done leaves little more to be desired. So far as we can judge, the illustrations are original, and in each instance they are exceptionally fine. When we come to consider the functions of the several parts of the aural organism, we are confident that less progress has been made than in the study of almost any other organ or structure of the body. For instance, who of all our investigators, is fully satisfied in his own mind as to the physiology of the labyrinth? Then again, such are the minuteness and delicacy of the structures that, in the progress of disease, rarely is one alone involved, often rendering it exceedingly difficult to determine which

is responsible for a given set of symptoms manifested during life.

One by one the component structures are carefully considered, their physiological uses, according to the author's view, are stated, and their diseases and treatment clearly set forth. Ample instruction is given for the proper examination of patients. The instruments needed in the treatment of aural affections are well described and illustrated. With such a work at hand, there is no excuse for that amount of uncertainty, and of positive ignorance, which so largely prevails among the masses of the profession, with reference to the diseases of the aural organism, and the most approved methods of treatment.

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

As a considerable portion of the last letter was devoted to the ambulance service of the city, in connection with the report of the grand jury's committee, a few particulars in regard to the life of the ambulance surgeon in our hospitals may perhaps be of interest. This responsible official usually sleeps on a cot immediately above which are placed two large gongs. One is the regular fire gong, and when an ambulance call is sent through the fire-box this rings 20, and then the number of the district. The other gong connects with the telephone, which keeps on ringing till he awakes and pulls a string for it to stop. As soon as he hears the call he touches a button which gives the signal at the stable, where the horses are trained to spring to their places in the same way that the fire department animals answer an alarm. The ambulance surgeon is allowed from three to five minutes in which to dress and get to his position on the ambulance.

When two districts lie close together it is a point of honor to see which ambulance will be first on the ground; consequently there is considerable rivalry as to which brings in the case. It is related that on one occasion when a case occurred about the middle of the new Washington bridge on the Harlem, the ambulances from two different hospitals simultaneously arrived at opposite ends of the bridge. There was then a hot race to get to the patient first, and as both of the ambulances dashed up exactly at the same minute, there was considerable wrangling between the rival surgeons and drivers as to which hospital was entitled to him.

The ambulance surgeons sometimes have some very exciting experiences, as well as sometimes very amusing ones, and when a young man first goes on to this service, he is likely to find his position a very trying one. All drunk and insane cases are, as a rule, required to be taken to Bellevue, and if the patient has to be carried from a long distance, as Harlem, for instance, the ambulance surgeon's lot is not always a happy one during the drive. One of them relates one of his experiences as follows: "One Sunday when I was coming down through the

Park and Fifth avenue with a case of delirium tremens I didn't know but I would have to be taken inside with nervous prostration myself before we got through. That miserable wretch would wait till we got right in the midst of a lot of swell turnouts, with ladies and children inside and solemn coachmen and footmen on the outside, and then he would let forth the most fiendish yells and shrieks, and struggle until it seemed that he would break every strap which held him down. Sometimes the horses near by would shy, the ladies would look frightened half to death, and everybody would gaze at me in a manner that was extremely depressing to a quiet, retiring sort of a man. On arriving at the hospital the patient insisted that we had kept a big black dog in with him all the way, and that the beast had bitten him several times." Not infrequently impostors and maligners, who want to have a few days comfortable lodging and board free, contrive to get taken to the hospitals, especially after dark; but when, as is often the case, the actual cautery is prescribed for the treatment of the supposed injury or disease, it takes an astonishingly short space of time to get rid of this class of patients. The sight of the iron, even before it is heated, is generally sufficient to produce an instantaneous cure.

Among the Sisters of the Poor of St. Francis who have charge of the nursing in St. Francis' Hospital, which is situated on the east side of town, in the midst of a dense German population, is one, Sister Emerana, who, by her life of devoted zeal for the relief of suffering and sorrow, has won for herself among the hospital people the title of "Captain of the Wretched." She was born in Germany, and at an early age assumed the vows of the religious life. When the Franco-Prussian war broke out, she left the peaceful convent where she resided for the battle-field, and did heroic service as a nurse in the camp hospitals attached to the German army. It sometimes happened that the wounded were brought in in such numbers that it was impossible to give them all immediate surgical care, and the brave young nurse had to do what she could to supply a surgeon's place. She thus gained an experience in practical surgery and the dressing of wounds that has since proved of the greatest value. At the end of the war she labored for a time in the various hospitals established by her religious order in Germany, and some years ago came to America. At St. Francis' Hospital she is invaluable as a nurse and as an assistant at operations, and in the outdoor department, where every morning a number of patients crowd in from the street to have their wounds dressed, a large part of the work is done by her. At the same time she humbly takes her share in the daily scrubbing of the hospital wards, and although possessed of great natural capacity to govern others, she is always rigidly obedient to the rules of her order. In any sphere of life Sister Emerana would have been a remarkable woman. In that which she has chosen she furnishes a beautiful example of heroic self-sacrifice, leading her little company courageously forward in the grim battle with suffering and death; lifting up the fallen, cheering the faint-hearted, and soothing the last moments of the dying.

The newspapers report the case of a patient in St.

Joseph's Hospital, in the neighboring town of Paterson, N. J., who practically fasted for sixty days, although he did take a cup of tea or a glass of water from time to time. Some two months and a half ago the man was admitted, suffering from an injury to the spine which it was thought would prove fatal. He was unable to retain food, and, losing all taste for it, he determined to do without eating for a time. He was carefully watched, and although he became excessively emaciated, he remained cheerful, and stated that he felt much better than when he attempted to eat. At the expiration of sixty days he said that he felt like eating something, and "thought he would like a piece of home-made pie." The account does not mention whether his physicians gave their consent to the patient having his pie, but at all events, it was given him, and it is stated that from that time he began to improve rapidly, and now expects soon to leave the hospital quite well.

In the case of a laborer who was overcome by the heat one day recently during the hot weather, and who was taken to the Presbyterian Hospital, the patient's temperature is said to have reached the extreme point of 111°. The man recovered.

One would hardly select a crowded excursion barge on the Hudson River as a place of accouchement, yet the other Sunday an Irish woman gave birth to a child, without medical assistance, on a trip of this kind, in only such seclusion as the captain's cabin afforded. There were altogether five thousand people on board the two barges used for the excursion, dancing and otherwise enjoying themselves, and the rapidity with which the news, "it is a boy," spread among them, is said to have been something extraordinary.

P. B. P.

MISCELLANY.

MESSRS. J. B. LIPPINCOTT COMPANY announce that they will publish, about September 1st, the eighth edition of Wood's Therapeutics; its Principles and Practice; rearranged, rewritten, and enlarged. Scarcely three years have elapsed since the appearance of the seventh edition, yet the preparation of the present volume has necessitated a careful study by its author of more than seven hundred memoirs. In the present edition no revolutionary changes have been made comparable to those of the seventh revision, but great care has been exercised to see that every portion of the work has been thoroughly revised, and a number of the articles have been completely rewritten, while some new drugs have been noticed. Among those portions of the book which are practically new may be mentioned, as important, the whole subject of anæsthetics, the articles upon cocaine, strophanthus, caffeine, antipyrin, antefebirin, phenacetin, hydrastine, paraldehyd, lead-poisoning, etc. Among the absolutely new articles may be mentioned sulphonal, chloralamid, aristol, and others.

RESIGNATION OF A QUACK EXTERMINATOR.—Dr. John H. Rauch, the efficient Secretary of the Illinois State Board of Health since its organization in 1878, and prior to that of the Chicago Board of Health, has resigned. He was the terror of quacks and ignorant pretenders, for whom he made it so hot in Illinois that they had to seek hospitality in neighboring States. His

chosen motto was "down with quackery!" or words to that effect, though as an official he was a man of action rather than words. His warfare against the parasites was not mere smoke—there was fire behind it, a smoldering magazine, as the miscreants soon found out to their sorrow. He not only drove them out of Illinois, but his method of dealing with them was contagious, and other States caught the idea and enacted laws for the suppression of quackery patterned after that of Illinois. He was also an indefatigable worker in the department of sanitary science and inaugurated many reforms in the administration of public health affairs in Illinois. It has been chiefly through his work that the standard of medical education throughout the country has been elevated to its present position, for the requirements of the Illinois State Board of Health have been largely instrumental in developing a more thorough course of instruction upon the part of medical colleges. In his resignation the Board sustains an irreparable loss.

CAFFEINE.—Dr. Gempt urges the use of caffeine in cases of threatened collapse in various asthenic diseases, but especially in acute pneumonia, and cites several cases in which it was successfully used in conjunction with stimulants. He believes the drug indicated in the course of acute pneumonia when there is evidence of cardiac failure, such as rapid, irregular pulse with lowered tension. Should the pneumonia be of asthenic type, it should be used from the onset, and the earlier in the course of the disease it is used after asthenia develops the better. In cases of this sort, caffeine, in doses of .35 gram four to five times daily, raises the arterial tension, diminishes the rate of the respiration and pulse and lowers the temperature. Its action is prompt, but in urgent cases it had better be used hypodermically. It is advisable to continue it for a brief period after the febrile defervescence.—*Boston Med. and Surg. Journal.*

AN IMPROVED METHOD OF GRAFTING ULCERS.—Having had an exceptionally large number of chronic ulcers of the leg, which incapacitated the patients from work, and finally brought them into the infirmary, I tried the ordinary methods of grafting, but being disgusted with the very large number of total failures I experienced, I undertook various experiments, and at last adopted the following plan, which I distinctly disclaim as my own, but which consists in adopting and combining the ideas of several people. The success I obtained with this method was so marked that I think a large number of practitioners at home and abroad (in India especially, where I found all ulcers very intractable under ordinary treatment) will welcome it. Even when the ulcer is deep, with hard thickened edges and extending all round the limb, the method applies. This is to cleanse the surface well for two or three days with boracic fomentations, and then (contrary to what I was taught) slightly abrade the granulations, just sufficient to cause oozing, and apply the graft directly to the abraded surface, where it is held in position by a small pile made of half-inch squares of green protective, four or five squares being placed one on the top of the other. A graft is thus applied to every square inch of surface. And now comes the most important thing of all, and which is an idea I received from a friend. This is to encircle the limb with a fold of carbolic gauze, which extends two or three inches above and below the ulcer, where it is attached to the sound skin by collodion. The ulcer is then thoroughly dredged with boracic powder through the gauze, and the whole is wrapped in a layer of wet boracic lint, which is kept thoroughly moist. As a rule, the dressing is not disturbed for three days, when the lint is removed, and the limb well irrigated with boracic lotion, the grafts remaining perfectly secure under their heaps of protective, which is again kept in position by the gauze.

The limb is then redusted with boracic powder, and

done up in the wet lint, which is now changed daily. At the end of ten days the gauze and protective are removed, and each graft will be found as large as a sixpence, while those near the edges will have exercised a spermatic influence, and caused a rapid ingrowing of epithelium. Since adopting the above plan, I may say I never lost a single graft, though employed on most unfavorable surfaces—a very different result to the old way of covering the grafts with a large piece of protective which retained some exudations under it, and thus bathed the tender graft in a poisonous medium, with a result that 80 per cent. of them never "took."—Gill, *The Lancet.*

SPINAL INJURIES.—If your patient is really suffering from a spinal lesion, you may expect to find one or more of the following *objective* symptoms to exist, to-wit:

1. Emaciation. Generally most noticeable in groups of muscles deprived of normal nerve stimuli.
2. Fibrillary twitchings and tremors of individual muscular bundles.
3. Flushings, generally confined to face or upper portion of body.
4. Heart and pulse conditions, if abnormal and not existing before injury, may reasonably be referred to the injury.
5. Ephidrosis, indicating a depressed nervous condition.
6. Cold extremities, a symptom not possible to feign.
7. Cyanosis.
8. Pupillary dilatation, indicating nervous irritation.
9. Condition of reflexes.

In conducting the examination in medico-legal cases avoid leading questions.

It is my custom to let patients describe their symptoms or tell their story without the least suggestion from me. It is your duty to ascertain if your patient has read any work upon spinal injury since the accident, and before arriving at a definite diagnosis consider the patient's former character, especially as to veracity.

I believe it well to make repeated examinations, as different examinations may reveal widely different results.

In conclusion, you will find it impossible to arrive at your diagnosis from any one or any two symptoms, but rather from the aggregate phenomena that go to make up the clinical picture.—*Millard, N. W. Lancet.*

STERILIZATION OF CATGUT.—C. Brunner (Zurich) recommends the following method for the sterilization of catgut:

Place for one or two days in ether, then place in xylol, using a preserve glass, and heat in a sterilizing apparatus for three hours, wash with alcohol to remove the xylol; and keep in a solution of 1 part sublimate, 900 parts absolute alcohol, and 100 parts glycerine. After three days the catgut is ready for use. Before using pass the catgut through a sublimate solution (aqueous).—*Beiträge zur Klin. Chirurgie.*

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from August 15, 1891, to August 21, 1891.

Lieut.-Col. Joseph C. Baily, Asst. Medical Purveyor, granted one month's ordinary leave, in extension of sick leave. Asst. Surgeon Charles M. Gandy, U. S. A., will, upon the final adjournment of the Army Medical Board, resume his leave of absence.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending August 22, 1891.

P. A. Surgeon W. R. DuBose, ordered to duty at Naval Academy, Annapolis.

Surgeon G. E. H. Harmon, detached from Naval Academy, Annapolis, and wait orders.

Surgeon Howard Wells, ordered for temporary duty at Naval Station, New London.

Medical Inspector A. A. Hochling, Surgeon J. B. Parker, and P. A. Surgeon O. D. Norton, ordered to Naval Academy, Annapolis, September 3, to examine physically candidates for admission to the Naval Academy.

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NO. 10.

ORIGINAL ARTICLES.

FURTHER CONTRIBUTIONS TO KERATOMETRY.

Read in the Section of Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY SWAN M. BURNETT, M.D., PH.D.,
OF WASHINGTON, D. C.

Professor of Ophthalmology and Otology at the Georgetown University, Ophthalmic and Aural Surgeon at the Garfield Hospital, Providence Hospital, and the Children's Hospital, Director of the Eye and Ear Clinic at the Central Dispensary and Emergency Hospital.

It is now nearly seven years since I began to use the ophthalmometer of Javal and Schiotz daily in my practice, and six years since I published my first results from its use.¹

I appreciated the great practical value of the instrument from the beginning, and have persistently attempted to keep its importance as an instrument of diagnosis in astigmatism before the profession. For a time the apathy and indifference to its value were as intense here as they still seem to be in England and Germany, but recently there have been evidences of a greater interest in the instrument, so that, whereas six years ago, so far as I am aware, there were only three in use in this country, there is now, I understand, difficulty in getting orders for it filled.

In my Treatise on Astigmatism,² I made the statement that I regarded it as the most important instrument of positive diagnosis given to us since the invention of the ophthalmoscope, and I have as yet no cause to retract or modify that opinion. It must be borne in mind, how-

ever, as has been said before, that the principal use of the instrument is in the determination of astigmatism. Of the general refractive condition of the eye it gives us no idea. General ametropia, with only the rarest exceptions, is due to variations in the length of the eye-ball; on the other hand, the use of this instrument has taught us how constantly astigmatism has its seat in the cornea. Previous to the introduction of this instrument, this was more or less of an assumption. In one of my statistical papers,³ I have shown how rare it is to find astigmatism any other than according to rule, that is astigmatism with the greatest curvature in, or approaching the vertical meridian. The examination of several thousand eyes since that time has confirmed that statement fully. It is also a fact that it is very seldom we find a cornea without a measurable degree of astigmatism. Normal corneal astigmatism I would place at 0.25 or 0.5 D., and according to the rule. This is true of eyes in which every test has shown the existence of emmetropia, this no glass, spherical or cylindrical, has improved vision for our test letters. Now a half dioptre of total astigmatism, or even less, is very demonstrable subjectively, and is often the cause of asthenopia, so that it would seem that this corneal astigmatism must be corrected by an astigmatism of the lens of an equal degree, which is, moreover, contrary to the rule.

This lenticular astigmatism may be due to an unequal contraction of the ciliary muscles, causing an astigmatic curvature of the lens surfaces, or to a tilted position of the lens respecting the visual axis.

The latter, in my opinion, is much commoner than is generally allowed, particularly as a corrective of the normal astigmatism of the cornea. I am fully aware that we are not, as yet, in possession of sufficient data for final generalizations, but the indications point to something like this: Normal astigmatism of the cornea, according to the rule, probably due to lid pressure; corrective astigmatism of the lens, contrary to the rule, probably due to the rotation of the lens on its vertical axis, cause undetermined.

My observation leads me to believe that this

¹ These publications are as follows:

Ophthalmometry with the Ophthalmometer of Javal and Schiotz with an account of a Case of Keratoconus, Arch. of Oph., Nos. 2 and 3, 1885.

A treatise on Astigmatism, Chambers and Company, St. Louis, 1887.

An Analysis of the Refractions of Five Hundred and Seventy-six Healthy Human Corneæ Examined with the Ophthalmometer of Javal and Schiotz, Trans. of the Am. Oph. Soc., 1888.

Regular Astigmatism Following Cataract Extraction, Am. Journ. of Oph., December, 1889.

Lenticular Regular Astigmatism, Medical News, September 14, 1889.

At the beginning of this year Dr. Javal published a volume, "Memoires d'Ophthalmometrie, Annotees et Precedees d'un Introduction par E. Javal," in which he reprints forty-five articles that have appeared in various languages and that have for their bases the experience obtained from the use of his instrument.

² Chambers and Co., St. Louis, 1887.

³ Refraction of 576 Healthy Human Corneæ, Trans. Am. Oph. Soc., 1888.

lenticular astigmatism against the rule is nearly always present, for when I find the ophthalmometric readings show either no corneal astigmatism or a slight astigmatism against the rule, there is tolerably certain to be an astigmatism demonstrable subjectively against the rule. So constantly have I found this to be the case that I have formulated the following law to which there are, I think, only occasional exceptions: For the total subjective astigmatism, subtract 0.5 D. from the corneal astigmatism when it is according to the rule, and add 0.5 D. if the corneal astigmatism is against the rule.⁴

In a healthy eye I think this astigmatism, due to the turning of the lens on its vertical axis, rarely exceeds 0.5 D. When the lenticular astigmatism is greater than that I suspect an implication of the ciliary muscle and resort at once to a mydriatic.

I do not believe, as some appear to do, that the ophthalmometer enables us to dispense altogether with paralysis of accommodation, but it does, I think, make the necessity for its use less frequent, and the indications more direct and certain. For example: the ophthalmometric readings show 2 D. of astigmatism according to the rule, whereas the subjective test shows none at all or probably 0.75. I then suspect a partial accommodation which neutralizes the 1.25 D. of corneal astigmatism remaining, and usually a mydriatic brings it to light.

The form of the cornea of the two eyes is usually approximately the same, that is to say, if there is a corneal astigmatism it is nearly always of the same variety. To this, however, there may be exceptions, one of which I have seen, and is so unusual that I will here record it:

B. F., a girl of 13, had in the left eye a corneal astigmatism of 2.5 D., contrary to the rule, the right had a corneal astigmatism of the same degree, but according to the rule. Under a mydriatic perfect vision was obtained in the left with -2.5 axis 90° , and in the right with -0.75 \bigcirc -2.5 axis 180° , showing that the astigmatism in both eyes was wholly corneal, though of opposite kinds. The emmetropic meridian was the same in each, viz., 41 D.

Another fact which has been brought out by the use of the ophthalmometer is that the form of the cornea is often permanently changed by injury or disease. In my paper on "Astigmatism Resulting from Cataract Extraction,"⁵ I have shown that there is invariably an astigmatism contrary to the rule during the first weeks of healing of the wound. This astigmatism is sometimes enormous, amounting, as I have seen it, to as much as 8 D. Naturally, the visual acuteness of such an eye would be very much

reduced during the period of existence of this astigmatism, and which may extend to two or even three months. It is rare, however, to find an astigmatism above 3 D. persist after the perfect healing of a normal extraction.

I have not been able to demonstrate the existence of an astigmatism of the cornea following the operation for strabismus.

Astigmatism from trauma is seldom seen when the cornea is not involved. It is commonly found after an iridectomy, and may follow other injuries to the eyeball affecting the sclero-corneal junction. An interesting instance of traumatic corneal astigmatism is the following:

A. F., aged 29 years, received a blow on the left side of the head and eye from the bursting of a bottle. When I saw him, two or three days after the accident, there was some blood in the anterior chamber and an apparently superficial keratitis, but there was no solution of continuity anywhere in the ball. The blood was rapidly absorbed, and no evidence of internal injury was found. Some weeks later the keratitis returned, but yielded readily to treatment and the patient passed from observation. Three years later he returned for the purpose of having the eye re-examined, supposing that the diminished vision was due to the injury, and moreover was permanent. An examination with the ophthalmometer showed an astigmatism of 0.5 D., according to the rule, and vision equal to $\frac{5}{8}$ in the right; in the left the ophthalmometric measurement revealed an astigmatism of 1.5 D. at 135° and with $+1 \bigcirc -2$ 135° , vision = $\frac{5}{8}$. As the man stated that he was sure that his vision in the left, before the injury, had been equal to that of the right, we must conclude that the astigmatism was due to change in the form of the cornea produced by the injury, particularly as the meridian at 45° was 1.5 D. less than the weakest meridian in the right.

The following case shows in a most pronounced manner the changes that can come to the form of the cornea from long continued inflammation:

Mr. C. P., aged 32, was taken six years ago with acute trachoma accompanied with intense keratitis in both eyes. The left was virtually destroyed, and was finally removed on account of continual pain. When I saw him first in 1888, soon after this enucleation, the right cornea was in a condition of intense pannus, and vision was reduced to little more than perception of light. I treated the granulated lids with the solid copper stick, and in course of time improvement began, which continued until the cornea became almost perfectly clear. Vision was still, however, very low, fingers being counted only at two meters. In December, 1890, I made a keratometric examination and found the following condition: 100° 51 D., 10° X 2.5,—that is to say in the meridian with axis at 100° there was

⁴ I learn that Dr. Bull, of Paris, has formulated a similar law, using, however, 0.75 instead of 0.5 D. This I consider too high for the majority of eyes examined by me.

⁵ American Journal of Ophthalmology, December, 1889.

an access of 8 or 9 D. over the normal refraction (the normal being from 41 to 43 D.), with a still further increase of 2.5 D. in the opposing meridian. With $-9 \text{ C} - 2.5 \text{ D}$ vision advanced to $\frac{5}{25}$. The form of the cornea examined by Placido's disk showed no irregular astigmatism. The patient was most positive in his statement that previous to the inflammation his distant vision was good, and that while living on the plains he could distinguish small objects at a distance better than most of his companions. Assuming then, as is warranted, that the eye was emmetropic to begin with, we have here a corneal myopia of 9 D., and an astigmatism of 2.5 D. according to the rule, which we can probably refer to pressure exercised on the cornea when it was in an inflamed and softened condition. The kind of astigmatism would seem to carry out our idea that astigmatism according to the rule is caused by lid pressure.

That the changes from inflammation in the cornea, however, are not always those causing an increase of curvature is shown by the following case:

H. M., aged 16, suffers from the interstitial keratitis of inherited syphilis. She was under observation for a number of years, and was almost totally blind from the corneal combined with uveal inflammation. The cornea cleared up to a degree after a time, and in the left there was some useful vision remaining; the right was practically useless. Measurements of the left cornea gave the following: $15^\circ 35 \text{ D. } 120^\circ \times 2\frac{1}{4} \text{ D.}$ The form of the cornea was only moderately irregular, but there was a lessening of curvature amounting to at least 6 D. in its general refracting power, with a further diminution of 2.25 D. in one of its meridians. A $+ 2.5$ axis 90° increased vision from counting fingers at 3 meters to $\frac{5}{60}$. The $+ 6 \text{ D.}$ did not give an additional improvement.

A few words now in regard to the practical use of the instrument: It is true that it is not an apparatus that requires much time or practice to learn to manipulate properly, and yet certain conditions for its most successful operation are essential. In this country I do not think artificial illumination is at all necessary when a window can be used, which looks out to the open sky; but the relative positions of the instrument and the patient should be such that the patient's body does not form any obstruction to the light falling on the white bands in any position of the arc. This particular position, however, can be readily found by experimenting. It may not be without interest or value to those beginning the use of the instrument to know of the method I have found most satisfactory in recording ophthalmometric measurements. It is the shortest and simplest possible. I first find the meridian of least refraction as shown by the touching of

the two hands at their bases, I note the direction of this meridian, and then turn the arc until the bases of the bands are even again when the crossing of the one over the other is greatest. This amount of crossing I read on the corneal reflex, and note the meridian in which it occurs. The position of the right movable band on the arc gives the refraction of the weakest meridian in dioptries. This gives us all the necessary data, and I record it as follows, for example: $L. 45^\circ 23, 135^\circ \times 2$; this means that the meridian at 45° has a refraction of 43 D. (since 20 D. has to be added from the position of the white band on the left-hand-side of the arc to the position of the band on the right-hand-side, in order to get the total refraction of that meridian in dioptries). This, as you see, gives us, at a glance, the refraction in the weakest meridian, the direction of that meridian and the difference expressed in dioptries, between that and the refraction in the strongest meridian shown in the number of steps crossed, which is, of course, at right angles to it.

THE FULL CORRECTION OF AMETROPIA.

Read in the Section of Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY EDWARD JACKSON, A.M., M.D.,

PROFESSOR OF DISEASES OF THE EYE IN THE PHILADELPHIA POLYCLINIC, AND SURGEON TO WILLS' EYE HOSPITAL.

There is fairly general agreement that theoretically the emmetropic eye is the ideal eye; that it approaches its work under the most favorable conditions, that its possessor is to be congratulated, and that when an ametropic eye suffers from strain, one of the most important things that can be done for it—no matter what the kind of ametropia, no matter what its grade—is to give it the optical aids that will make the conditions under which it works more nearly approach those of the emmetropic eye. But in practice, I am aware that very many of you will not agree to follow the logical train to its legitimate sequence, that the best optical aid that you can furnish the ametropic eye is that which will most exactly conform its conditions of labor to those of the emmetropic eye; that is, the full correction of its ametropia.

The position that if the emmetropic eye works under the best possible conditions, the conditions that most nearly approach these are the best that can be secured for the ametropic eye, is so strong, that the burden of proof must be held to lie entirely on those who contest it. Let us examine some of the things that are urged against the full correction of ametropia.

It must be admitted, in the first place, that all lenses cause, when first used, certain disturbances in the relations of the visual acts. The spherical lens disturbs the relations between ac-

commodation and convergence, and differences between the correcting lenses of the two eyes necessitate a revision of the act of binocular fusion. On these accounts, for every pair of glasses put on there must be a longer or shorter period of adaptation. Of this period I can only say that other things, *including the strength of the glasses*, being equal, I am convinced that this period is on the whole apt to be less prolonged and less annoying when the correction for ametropia is a complete one, than when it is partial.

Taking up the objections to a full correction, in the various forms of ametropia, of astigmatism I shall say nothing, for the objections to its full correction are not generally allowed to influence practice, and have to do solely with the period of adaptation.

HYPEROPIA.

In hyperopia it is urged that patients will not or cannot see clearly at a distance if given the correction for total hyperopia. Probably the majority of ophthalmic surgeons believe this to be the case, and each could adduce cases innumerable to support his opinion. But let us see if there be not some more rational explanation of these cases, than the one of supposing that the hyperopic eye is subject to a species of inveterate normal "spasm" of the ciliary muscle, from which other eyes are quite exempt. I have never seen a case of such spasm that did not yield, allowing perfect distant vision with the correction for total H., within two months of the constant wearing of the lenses. I have seen but few that did not yield in two weeks, it is a quite exceptional case that does not yield in a few days, and in the great majority of eyes there is perfect distant vision from the start, if the glasses are commenced before the eye has entirely recovered from the influence of the mydriatic. I have repeatedly investigated cases of supposed inveterate ciliary spasm, and in each instance the supposition has been found to have no substantial basis.

But certain things must be borne in mind. First, that the glass that gives the best correction at 4 or 6 metres is not the correcting glass for the total H., but is an over-correction of $\frac{1}{4}$ or $\frac{1}{6}$ D. I know of no treatise on this subject that takes this into account. It seems like a very small matter. It is often convenient to call rays parallel that come from such a distance; but, strictly speaking, they are not parallel, and the glass that focusses them perfectly on the retina will not perfectly focus parallel rays. This $\frac{1}{4}$ or $\frac{1}{6}$ D. of inaccuracy introduced by the assumption that such rays are parallel, is just the inaccuracy that will make the entire difference between success and failure in the effort to correct the total hyperopia. Patients given a 0.25 D. over-correction, will not become accustomed to it and

see clearly at a distance in any length of time. This inaccuracy must be avoided if you are going to correct the total H. That is, instead of giving the glass that gives the best vision at 4 metres, we must order a lens $\frac{1}{4}$ D. weaker. Another thing to be borne in mind is the aberration of the eye. As I pointed out four years ago (see Trans. American Ophthal. Society, 1888), in the great majority of eyes, the refraction at the margin of the pupil differs from that of the centre. So the lens accepted with the dilated pupil, may be too strong or too weak when the pupil has contracted again.

If with the dilated pupil too weak a lens has been selected, it may be accepted even for really parallel rays, when the pupil is contracted, and this is the only way that we can ever account for the acceptance of the 6 metre correction by an eye that has perfect distant vision without any lens. But if the lens chosen for the dilated pupil is too strong for that portion of the pupil that remains in use after the contraction of the sphincter of the iris, even if the $\frac{1}{4}$ D. for the 4 or 6 metres divergence be deducted from the lens selected under the mydriatic, the remainder will still, for distant vision, be an over-correction, and no eye previously accustomed to perfect distant vision will ever accept it.

Another way in which this notion of the non-acceptance of a full correction has come about, is through the ordering, after an examination without a mydriatic, of a supposed exact correction, or supposed under-correction, which is in reality an over-correction. It comes about in this way. We get the impression from the books, and from our own experience, that latent hyperopia is present in most young eyes. It is found quite generally that young eyes will not, as the influence of a mydriatic goes off, or immediately after it has gone off, accept the convex correction that they did when under the mydriatic.

But my case records have proved conclusively to me that even where this was the case, the latency of the H. is not a fixed condition, but has often appeared after the use of the mydriatic. For instance, an eye showing H. 1.75 D. at first examination, and choosing the + 1.75 D. lens under duboisia, has, a week after the discontinuance of the duboisia, accepted nothing stronger than + 1.25 sph. Now, if I had not made the pre-mydriatic test, I would have supposed this eye brought to me 0.50 D. of its H. latent. And if, acting on this supposition, I had prescribed for the next case of the kind, without using a mydriatic, the strongest lens he could see clearly with, at 4 metres, I might have supposed myself safely inside of a margin of latent H. when no latent H. existed, and actually given an over-correction that would render all things slightly indistinct beyond 20 feet.

My experience shows that young hyperopes

very frequently come to us with none of their H. latent; but you can never certainly know if this is true in any given case, without the use of a mydriatic. I have repeatedly had to remove over-correcting convex lenses that had been ordered without the use of a mydriatic, and have found weak convex cylinders, ordered without mydriasis, where corresponding concaves were needed; the surgeon having been led by what usually happens as to low astigmatism, into prescribing the wrong lenses in the case with which we had to deal at the time.

But if it is admitted that the full convex correction would be accepted in all cases, if steadily worn for a few weeks or days, it will be urged that the great majority of patients will not submit to the inconvenience of those few days or weeks. The difficulty here is psychological. It does exist, I admit, but is serious in a comparatively very few cases.

Our patients usually come to us ready to submit to a good deal, if only we gain and keep their confidence that the ultimate result will be relief. They come ready to submit to the inconveniences of loss of time from business, while they wait day after day in our offices, to submit to the payment of our fees, often to the annoyance of a mydriatic, and the great majority of them will submit to this inconvenience of temporary indistinctness of distant vision, if it is not accompanied by a loss of confidence in the wisdom of their counselor.

In ordering a correction for the total H. a portion of which is latent, it makes all the difference between success and failure, whether we fully warn the patient of the indistinctness of distant vision he is likely to experience, and the length of time it is likely to continue, exaggerating this rather than minifying it, and explain the cause of it; or whether we leave the patient to discover the dimness and its duration for himself. In the one case he will remember our explanations as evidence that we foresaw the difficulty, that we knew what we were about. In the other case, he will be liable to regard our explanations as apologies designed to cover up our mistakes. Then this explanation of the annoyance, which may be illustrated by placing glasses before the eyes that produce it, will enable one to judge whether the particular patient will submit.

It may be said that the deductions I have urged on account of the divergence of rays from points 4 or 6 metres distant, and on account of the aberration of the eye, amount in effect to about the same thing as the practice of giving the correction for the manifest H., or of throwing off a certain fixed proportion of the total correction. But they do not; any more than that amounted to exact justice when the ruler cut off the head of one of his subjects on the first day

of each month, not because that particular subject had done anything worthy of the death penalty, but because probably, during the month, some such crime would be committed within his dominion.

MYOPIA.

The unwillingness of surgeons to order the full correction for myopic eyes, notwithstanding the fact that such a correction would give the best distant vision, is probably based wholly on fear of causing increase in the myopia by strain of the accommodation. I know of no sufficient clinical evidence to support the supposition. My experience indicates that the constant wearing of the full correction lenses, no matter what their strength, with careful attention to other points of ocular hygiene, checks promptly and permanently the advance of myopia in the majority of cases. I have recently examined the eyes of a lady who, as a school-girl, suffering from rapid increase of myopia, was given the full correction of the high compound myopic astigmatism over fifteen years ago, and it practically corrects her error of refraction to-day, and her ocular health is now excellent. Experience has led me year by year to order the full correction of higher degrees of myopia, with greater confidence, in any case that habitually has or can get fair binocular vision, such glasses usually being worn by young people for near as well as distant vision.

Let us see on what considerations the contrary practice is founded. Apparently on theoretical considerations which I believe to be incorrect. Iwanoff stated that he found essential differences between the ciliary muscle of the hyperopic and that of the myopic eye. Later investigators have failed to confirm it, and it is probably incorrect. Then many works state that in myopes, because it is less used, the power of accommodation is less than in hyperopes of the same age. My measurements of the power of accommodation indicate no considerable difference. Of course, myopes, putting on strong concave lenses, have great difficulty in near seeing, at first. But this is due simply to the disarrangement of the accustomed relation of accommodation to convergence, is a phenomenon of the period of adaptation, and careful determination of the range of accommodation for each eye singly shows that it is not deficient in accommodative power. Sometimes, indeed, it is essential to break the transition to the full correction, by partial correction; but this is merely a step toward the end, the constant wearing of the full correction.

This statement is not intended to apply with full force to cases of myopia that have given up binocular vision, or where the vision is so poor from other causes that distinct focussing of rays on the retina cannot be fully appreciated, but it does apply strictly to the great mass of cases of myopia.

Another thing that has misled some very careful students, is the fear of increased congestion of the vascular coat from increased functional activity of the ciliary muscle, increasing the intraocular tension.

The belief in increase of the intraocular tension by accommodation is founded on two things, namely: certain experiments on the eyes of lower animals, and the increase of pulsation in the retinal veins on active accommodation. Of the experimental evidence it may be said, that it is quite contradictory; much the better of it, as it appears to me, seeming to show that there is no increase of intraocular tension in the globe with accommodation. But the conditions of the experiment are so different from those of normal human accommodation, that it has very little force one way or the other.

As to the increased pulsation that occurs in pulsating veins under strong accommodation, we must remember that we cannot increase the tension of the ciliary muscle without increasing that of the internal rectus, and if actual convergence does not occur, it is only because the tension of the external rectus is also increased, and in either case the result is necessary increase in the pressure on the globe from without; to which it is far more rational to ascribe the increased pulsation than to a supposititious influence of the accommodation.

I am not inclined to underrate the importance of hyperæmia in producing distension of the globe, but it is pathological hyperæmia, not physiological. I recognize fully the influence of eye-strain in the production of myopia, but it is eye *strain*, not eye *use*, that does it. We must discriminate more sharply between use and abuse. The normal performance of function is just as necessary to health, as the abnormal excess of demand is dangerous to it. And without adding additional evidence which is at hand, I rest the claim that, for the myopic as for the hyperopic eye, the most favorable conditions for labor that can be imposed on it are, in general, those under which the emmetropic eye works, most nearly brought about by the wearing of the full correction.

Therefore, in my practice and in my teaching, I have laid it down as a cardinal rule to give the full correction for ametropia—a rule to which exceptions are to be made, but only for special, clearly marked and important indications.

DISCUSSION.

DR. G. C. SAVAGE said: There are cases of ametropia in which a full correction cannot be made. For instance, in a case of astigmatism with one eye according to the rule and the other contrary to the rule, if the meridians are one vertical and the other horizontal, full correction can be given; but if the meridians are oblique it

will give rise to confusion, due to oblique direction of the eyes. In myopia in one eye and hyperopia in the other, there is no strain so long as looking through the optical centres of the lenses; but in looking down, for instance, near him, the deviation of the eyes from the optical centres produces confused prismatic action, on account of the contrary prismatic effect of the lenses when oblique. Such lenses can only be tolerated by decentering them. Again, in hyperopia in both or myopia in both eyes, but differing in degree, the same irregular prismatic displacement occurs when not looking through the optical centres, and the muscles are likewise put on a strain.

DR. GEO. M. GOULD: A word as to full correction. It is commonly said by the advocates of full correction that we are to aim to put the eye in an emmetropic condition; that this is the ideal condition we seek to bring about. I deny the major premises *in toto*. The wherefore is correct if the whereas is allowed. I cannot allow it. And for the following reasons:

1. The history of the pair of eyes we are prescribing for is often, and generally, one of abnormal use, of abuse long continued; the eye, from its history, is in an abnormal condition, and cannot be proceeded with as if it were a normally and physiologically reacting organ.

2. Long abnormalism of deficiency or excess of function has begotten organic changes in the eye itself and its innervation mechanism. In hyperopia the ciliary muscle is excessively developed, in myopia it is excessively weakened, in astigmatism it is unphysiologically developed. These organic and functional changes cannot be neutralized quickly, and will continue to mar the results of all cast-iron rules for a time dependent upon the length of evolution of the defect, the peculiarities of reaction, vital forces, temperament, etc.

3. The work these eyes has to do is so far from ideal that abstract rules will not apply. Civilization brutally crushes ocular ideals as ruthlessly as many another. Sewing girls, bookkeepers, literary people, etc., who must work at near range from twelve to sixteen hours a day, cannot listen to ideals, whether ocular or psychical.

Many other reasons conspire to lead me to lend no ear to abstract rules. Sometimes I over-correct hyperopia, sometimes I aim at artificial emmetropia; usually I under-correct. The bitterest of errors, I think, is to fully correct myopia. I might do it in a farmer, but in an urban liver never. So long as one does it I believe many of his patients must finally leave him. Nearly all patients coming to me from other oculists are these examples of full correction. It is selfishly a good plan for us to encourage in others, but I believe it bad for our patients and our science. In myopia it puts the weakened ciliary muscle

a strain that is the equivalent of an irritating hyperopia of a degree corresponding with the size of the error, the length of continuance, the reacting quality of the organism and the amount of near work to be done. In hyperopia the hypertrophied ciliary muscle will refuse inaction, or even a very partial deprivation of its accustomed work, for months, and if of long evolution, for years. In astigmatism the reaction comes very promptly, and I find that usually full correction is borne very satisfactorily, though even here exceptions occur. Instead of aiming at an ideal emmetropia, I find as a matter of fact must aim usually at an ideal of slight myopia, varying from 0.37 D. to 1 and even 2 dioptrics. In a myope this can be done at once, in a hyperope never at once, except for extreme near work, but often in the course of time, or by means of a second pair of lenses for near work, though presbyopia proper is a long way off.

DR. J. H. THOMPSON finds many cases where anisometropia the slightest difference in glasses will not be borne. Thinks also it is dangerous to give full correction in myopia.

DR. JACKSON, closing the discussion, said: In high degrees of anisometropia it is necessary to properly decentre the glasses, and this is often unsatisfactory. It is impossible to correct where the difference is greater than 1.5 D. or 2 D. There are cases in which full correction is not practicable, owing, perhaps, to what the patient has been accustomed; but when it can be borne, full correction should always be given.

ONE HUNDRED CASES OF ASTIGMATISM CONTRARY TO THE RULE, AND THE ASSOCIATED SYMPTOMS.

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Ever since the days when Weir Mitchell called attention to the intimate connection between a variety of headaches and the existence of errors of refraction, before which time this close association had not received at the hands of neurologists extensive study, the literature of ophthalmology and neurology has been burdened with numerous communications upon this relationship, until now the investigation of a case of headache is not complete until the refraction of the eye and the balance of the ocular muscles have been carefully considered. All forms of refraction error are known to be the cause of headaches, and usually it is considered that the presence of astigmatism, either of the simple or compound type, aggravates the amount of the head-pain. It has been stated that when the astigmatism is contrary to the rule, the entire cor-

rection of the error is more absolutely necessary to bring relief, and that its uncorrected presence is more potent in producing general nervous phenomena, than when the astigmatism is according to the rule. More than this, the researches of Schoen on the influence of accommodative strain in the production of glaucoma and cataract are important additions to our knowledge of the influence of astigmatism, both of the usual and unusual varieties, upon the ultimate well being of ametropic eyes. So, also, Theobald, of Baltimore, has studied a number of examples of astigmatism contrary to the rule, and adduced evidence to show that under certain circumstances this condition of refraction may conduce to the development of glaucoma. The following cases were analyzed because they have been under observation for a sufficient length of time to determine in practically all of them the exact value of their correction, and also to have studied the associated symptoms in sufficient detail to demonstrate whether or not they were out of proportion to the character or the amount of the refraction error. In all of the cases a mydriatic was employed, except in those where the use of such a drug was contra-indicated by glaucomatous symptoms. In patients over 45 the mydriatic was homatropine; in those under 45 either atropine or hyoscyamine. Whenever it was necessary the spherical lens required by the age of the patient, was ordered for the purposes of reading and close vision. This glass is not set down in the notes. For the convenience of study they may be gathered into four groups:

1. Cases presenting themselves for treatment on account of optical reasons alone—beginning presbyopia, or dissatisfaction with convex spherical lenses. No pain and no reflex symptoms.

Case 1. Beginning Presbyopia.—M. T., a man aged 41; no headache; no asthenopia; tricky close vision. Healthy fundus, with the exception of slight absorption of the pigment epithelium of the choroid.

O. D. + .25s \odot + .90c axis 15 $\frac{1}{2}$. O. S. + .25s \odot + .75c axis 150 $\frac{1}{2}$. These lenses were entirely satisfactory.

Case 2. Unsatisfactory Reading Glasses (Convex).—F. E., a woman aged 57; no general disease; no ill health or reflex neurosis traceable to eye strain; unsatisfactory reading glasses. Fundus healthy.

O. D. + .50s \odot + .50c axis 15 $\frac{1}{2}$. O. S. + .50s \odot + .50c axis 165 $\frac{1}{2}$.

Case 3. Eye-tire and Blurred Vision at Close Work.—L. K. B., a woman aged 30; perfect general health; no headache but unsatisfactory endurance with simple convex lenses. Normal fundus.

O. D. + 2.s \odot + .25c axis H $\frac{1}{2}$. O. S. + 2.25s \odot + .50c axis 165 $\frac{1}{2}$. The desired improvement resulted.

Case 4. High H; Blurred Vision during Reading.—A. E., a woman aged 44; perfect general health; eyes tire and print blurs; the convex reading lenses do not suffice; no headaches and no asthenopia. Healthy, hypermetropic fundus.

O. D. + 4.50s \bigcirc + .25c axis 15 $\frac{2}{0}$. O. S. + 5.s \bigcirc + .25c axis H $\frac{2}{0}$.

Case 5. Unsatisfactory Reading Glasses.—D. I., a woman aged 63; good general health with the exception of hay fever; glasses—convex sphericals corresponding to age—do not permit entirely comfortable reading, or sufficient eye endurance. Round, somewhat gray-red discs.

O. D. + 1.s \bigcirc + .25c axis 150 $\frac{2}{0}$. O. S. + 2.s \bigcirc + .60c axis 30 $\frac{2}{0}$. These glasses with a corresponding correction for reading, were satisfactory.

Case 6. No symptoms of Eye-strain; "wants new glasses."—C. W., a woman aged 58; perfect general health; has worn glasses for reading purposes for a number of years which recently have not permitted sufficient eye-endurance. These glasses are simple sphericals. There is no headache. Fundus perfectly normal.

O. D. + .25s \bigcirc + .50c axis 15 $\frac{2}{0}$. O. D. + .75s \bigcirc .25c axis 165 $\frac{2}{0}$. These lenses have answered a satisfactory purpose.

Case 7. No symptoms of Eye strain; "wants new glasses."—S. W. M., a woman aged 55; perfect general health; has worn glasses for reading for a number of years, which are simple sphericals and have recently not permitted comfort with reading. The patient states that she had iritis in youth, and the left pupil is slightly distorted above. In each eye the discs are rather gray, but there is no decided lesion of the fundus.

O. D. +s 1.25c \bigcirc + .25 axis 15 $\frac{2}{0}$. O. S. +s 1.25c \bigcirc + .75 axis H $\frac{2}{0}$. These lenses associated with the proper presbyopic correction have proved entirely satisfactory.

Case 8. Beginning Presbyopia; No Headache.—M. H. T., a woman, aged 44; in perfect general health; complains of some blur of vision at the near point, inability to thread the needle, and slight smarting of the edges of the eyelid; has never worn glasses. In each eye an oval disc; no conus; a fairly healthy eyeground.

O. D. + .25s \bigcirc + 1.25c axis 30 $\frac{2}{0}$. O. S. + .50s \bigcirc + .25c axis 150 $\frac{2}{0}$. These glasses were entirely satisfactory.

Case 9. Unsatisfactory Reading Glasses; No Headache.—J. J. S., a man, aged 55; has never worn any glasses except those which he bought in stores, and is using at present a + 3 with which he sees indistinctly at times, but otherwise complains of no symptom at all; his general health is good. The ophthalmoscope shows in each eye an oval disc, somewhat gray in its deeper layers, and a slight gray haze of the retina.

O. D. + 1.50s \bigcirc + .25c axis H $\frac{2}{0}$. O. S. +

1.25s \bigcirc + .50c axis H $\frac{2}{0}$. These lenses combined with a suitable presbyopic correction afforded the relief he desired.

Case 10. Unsatisfactory Reading Glasses; No Headache.—A. B., a woman, aged 52; good general health; complains of some mistiness while attempting to read, and also when looking at a distance; never has had an attack of headache. Wears a convex spherical of + 3 D.; media clear; tension normal. Oval discs with slight veiling of the lower and inner edges.

O. D. + 2.s \bigcirc + .25c axis H $\frac{2}{0}$. O. S. + 1.50s \bigcirc + 1.25c axis H $\frac{2}{0}$. These glasses combined with the necessary addition for reading answered her purposes very satisfactorily.

Case 11. Imperfect Presbyopic Correction.—A. W., a woman, aged 48, complains of neither pain in the eye nor headache, but does not see satisfactorily with her reading glass which is + 4; general health good; media clear, discs oval; eyegrounds fairly healthy.

O. D. + 2.s \bigcirc + .75c axis H $\frac{2}{0}$. O. S. + 1.75s \bigcirc + .50c axis H $\frac{2}{0}$. These glasses, together with a suitable presbyopic correction placed in bifocals, were eminently satisfactory.

Case 12. Imperfect Presbyopic Correction.—E. W. a man, aged 62, in active business and perfect health, never has had a headache; complains that after reading for some time his vision blurs. He has worn presbyopic glasses, convex sphericals, for a number of years, having changed them at suitable intervals, but until recently has had no feeling of discomfort at all. The ophthalmoscope showed discs not more gray than was natural at his time of life, and the eyegrounds generally healthy.

O. D. + 1.50s \bigcirc + .90c axis 165 $\frac{2}{0}$. O. S. + 1.s \bigcirc + .90c axis H. $\frac{2}{0}$. The glasses afforded satisfaction.

Case 13. Unsatisfactory Reading Glasses.—J. A., a woman, aged 50, complains that she can not see distinctly with her reading glasses (+ 3.25); there is occasional slight smarting and burning of the eye lids; no headache; the general health good. In each eye there is a round disc with a slight absorbing crescent at its outer side; the general fundus in good condition.

O. D. + 1. \bigcirc + .25 axis H $\frac{2}{0}$. O. S. + 1.2 \bigcirc + .25 axis 30 $\frac{2}{0}$. This combined with a suitable spherical for reading gave the desired relief and the indistinct vision disappeared.

Case 14. Insufficient Reading Glasses; Slight Ocular Pain.—C. S. B., a man aged 48, in perfectly good general health, has worn glasses for eight or ten years, always simple, convex sphericals; from time to time he has used his eyes considerably, and also has had pain in them, but never any headache or other symptoms. In each eye there was an oval disc; no conus; rather pallid; the fundus in fair condition. O. D. + 1.25s \bigcirc + .25c axis 165 $\frac{2}{15}$. O. S. + .50s \bigcirc -

.65c axis H $\frac{2.0}{2.5}$. This combined with a suitable spherical yielded an excellent result.

Case 15. Imperfect Reading Glasses.—J. A., a woman aged 50, complains that during the act of reading she cannot see distinctly, but otherwise, with the exception of slight burning and smarting at the margins of the lids, has no symptoms of eye-strain; the general health is perfectly good; she has worn glasses for a number of years, always a simple spherical. In each eye there was a round disc with slight crescent at the outer side and an absorbing pigment line beyond.

O. D. + 1.5 \bigcirc + .25c axis H $\frac{2.0}{2.5}$. O. S. + 1.25s \bigcirc + .25c axis 30 $\frac{2.0}{2.5}$. This with a suitable presbyopic correction proved satisfactory.

Case 16. Unsatisfactory Reading Glasses; Slightly Blurred Vision.—M. R. H., a woman aged 54, has worn glasses for many years, but complains that after their use things blur somewhat; there is no pain and no headache, although the patient herself is a delicate woman having lost much sleep owing to the necessity of nursing a prolonged case of illness in her family. In each eye the disc was an oval, the central lymph sheaths full and the color of the papillæ slightly gray.

O. D. + 2.5 \bigcirc + .50c axis 15 $\frac{2.0}{4.0}$. O. S. + 2.5 \bigcirc + .50c axis 165 $\frac{2.0}{4.0}$. These glasses seem to help her, although the eye endurance has never been great; they certainly proved better than simple sphericals.

Case 17. Imperfect Reading Glasses; No Pain.—E. J. P., a woman aged 58, for years has suffered with a torpid liver and symptoms called dyspeptic probably owing to the same condition; curiously enough there never has been any pain and no headache; she has worn glasses for years, a simple convex spherical for reading. In each eye an oval optic disc, and scattered through the choroid numerous yellowish dots sometimes discrete and sometimes gathered in clusters; the central lymph sheaths full and the discs rather gray.

O. D. + 1.50s \bigcirc + 2.c axis 15 $\frac{2.0}{4.0}$. O. S. + 1.5 \bigcirc + .40c axis H $\frac{2.0}{1.5}$. These glasses and the suitable additional lenses for reading purposes gave entire satisfaction; indeed the patient complained of no special symptoms, and except for indistinct vision was reasonably well satisfied with glasses that paid no attention to her astigmatism.

Of these seventeen cases one was under thirty, seven between forty and fifty, and the remaining nine between fifty and sixty-three. In general terms these patients complained very slightly, the chief disability being lack of eye endurance, although in many instances they were people who, glassed as they were with simple convex lenses, yet read and worked at close ranges with comparative comfort. The desired increase in eye endurance came with the addition of the cylinders. It is noteworthy that in fourteen out of

the thirty-four eyes examined the correcting cylinder was as low as 0.25 dioptre; its absence was missed and its presence a relief. The eyegrounds in these cases presented no unusual features, and hence require no comment.

2. Cases characterized by blepharospasm, symptomatic conjunctivitis, oedema of the lids, epiphora, photophobia or muscæ.

Case 1. Blepharospasm.—M. A., a boy aged 9 years; perfect general health; no headache; constant blepharospasm. Oval, over-capillary disc with fine retinal striation.

O. D. + .60c axis H $\frac{1.5}{1.5}$. O. S. + .25s \bigcirc + .60c axis H $\frac{1.5}{1.5}$. Complete relief of the symptoms.

Case 2. Epiphora and Ocular Pain.—S. E., a man aged 62; very gouty; one attack of iritis; ocular pain and lachrymation with eye use. Gray red discs and remains of former iritis.

O. D. + .75s \bigcirc equals + .75c axis H $\frac{1.5}{1.5}$. O. S. + .90s axis H $\frac{1.5}{1.5}$. These glasses afforded relief. In addition the patient took anti-gout diet and iodide of soda.

Case 3. Recurring Attacks of Conjunctivitis; Occasional Temple Headache.—C. T., a woman aged 33; general health good; recurring attacks of conjunctivitis and coarse bulbar injection; some temple headache. No fundus lesion except retinal striation.

O. D. + 1.25s \bigcirc + 1.50c axis 165 $\frac{1.5}{1.5}$. O. S. + 3.50s \bigcirc + .75c axis 150 $\frac{1.5}{3.0}$. These glasses afforded entire relief.

Case 4. Epiphora.—C. U., a man aged 46; good general health; cannot read at night, and all reading produces epiphora. Fundus normal except slight blurring of the nasal edges of the discs.

O. D. + .50c axis H $\frac{1.5}{1.5}$. O. S. + .25c axis 15 $\frac{1.5}{1.5}$. The epiphora entirely ceased with the use of this correction added to a corresponding reading lens.

Case 5. Muscæ and Photophobia.—M. L., a woman aged 67; feeble general health without definite disease; reading produces photophobia with web-like film rising before the eyes, the center of the film dotted with darker points. Media clear; gray-red discs, edges slightly mellowed.

O. D. + 1.5 \bigcirc \times .60c axis H $\frac{1.5}{1.5}$. O. S. + 1.5 \bigcirc + .25c axis 30 $\frac{1.5}{1.5}$. These glasses relieved the photophobia, but did not at last accounts remove the muscæ.

Case 6. Photophobia and Ocular Pain.—B. L. J., a woman aged 52; has been the subject of nervous exhaustion and recently underwent the rest cure; now considers herself well; reading produces eye-pain and photophobia. Round discs with slight retinal haze.

O. D. + .25s \bigcirc + .50c axis H $\frac{2.0}{1.5}$. O. S. + .25s \bigcirc + .50c axis 15 $\frac{2.0}{1.5}$. The result was good.

Case 7. Muscæ; Occasional Supraorbital Neu-

ralgia.—C. T. A., a woman aged 56; subject to rheumatism; loses much sleep; muscæ, supraorbital neuralgia and ocular pain; each lens nucleus strongly marked. Oval, rather gray discs and hazy retinas.

O. D. + .60c axis H $\frac{2}{20}$. O. S. + .25s \bigcirc + .25c axis H $\frac{2}{20}$. These glasses markedly relieved the muscæ and the ocular pain, but not the supraorbital neuralgia. This was modified by antirheumatic treatment.

Case 8. Blepharospasm and Left Headache.—A. C. B., a man aged 18; general health good; has blepharospasm, blepharitis and headache chiefly on the left side; the left eye is amblyopic. There are no lesions of the fundus except that the disc on the left side is grayer than normal at his age of life.

O. D. + 1.25s \bigcirc + .25c axis H $\frac{2}{20}$. O. S. + 2.s \bigcirc + 1.25c axis H $\frac{2}{70}$. Complete relief of the symptoms.

Case 9. Œdema of Lids; Some General Headache.—S. C. a woman aged 20; in poor general health; subject to tonsillitis; has had several attacks of catarrhal jaundice; eyes troublesome since childhood. The margins of the disc are veiled; tortuous transverse vessels and woolly choroids.

O. D. + 2.s \bigcirc + .90c axis 15 $\frac{2}{20}$. O. S. + 1.50s \bigcirc + 1.25c axis 165 $\frac{2}{20}$. Relief followed. An attack of typhoid fever shortly afterward, prolonged in its course, rendered it difficult to say what value the correction had for the relief of the eye symptoms.

Case 10. Chronic Hyperæmia; Epiphora.—M. M., a woman aged 47, in good general health, constantly using her eyes, complains of burning, lachrymation, and heaviness of the lids. Inspection of the conjunctiva reveals the somewhat characteristic tear-soaked appearance of chronic hyperæmia. In each eye the disc is gray-red, and there is undue amount of retinal haze and opacity of the fibre layer.

O. D. + .25s \bigcirc + .37c axis 15 $\frac{2}{20}$. O. S. + .75s \bigcirc + .25c axis 165 $\frac{2}{20}$. The use of these glasses with the proper reading correction and a local astringent wash produced great relief.

Case 11. Vaso-motor Blepharitis; Asthenopia.—C. A. Y., a woman aged 25, excessively nervous; imagines she is going blind; worried about slight redness of the ciliary margins which grows worse after eye use; states that she cannot read or sew with any comfort; has worn for some time correction very similar to the one given below. Eye-grounds present oval discs; fairly healthy retinas; no conus.

O. D. + 2.25s \bigcirc + .60c axis H $\frac{2}{20}$. O. S. + 3.25s \bigcirc + .90c axis 165 $\frac{2}{20}$. The eyelids improved very considerably under the use of these glasses, although the patient's asthenopia, according to her own statement, did not improve. The field of vision in this case presented more or

less the typical characteristics seen in hysterical eyes.

Case 12. Chronic Hyperæmia of the Conjunctiva.—P. S., a man aged 42, complains of some epiphora and smarting of the eyelids, the conjunctiva of which presents the appearances of hyperæmia; he never has had a headache and has no asthenopia. In each eye the lymph sheaths are full and there is undue broadening of the scleral ring with haziness of the retinas. The patient uses tobacco and alcohol injudiciously, and has done enormous amounts of eye work.

O. D. + 1.75s \bigcirc + .75c axis H $\frac{2}{20}$. O. S. + 1.50s \bigcirc + .75c axis H $\frac{2}{20}$. These glasses together with a slight antiseptic wash afforded relief; the patient was not, however, under observation very long.

Case 13. Epiphora; Slight Ocular Pain.—J. R., a boy aged 8, complains of slight pain in his eyes and constant watering, especially after the act of reading; scarlet fever in youth, but no recent illness; headaches practically never present. In each eye an oval, unduly capillary disc and typical shot-silk retina.

O. D. + 1.50s \bigcirc + .90c axis 45 $\frac{2}{20}$. O. S. + 1.25s \bigcirc + .60c axis 165 $\frac{2}{20}$. One month later reports himself better, though the eyes occasionally grow red; watering has stopped; there are a few swollen lymph follicles on the retrotarsal folds.

These thirteen cases varied in age from eight to sixty-seven years, and presented as their most prominent complaint one or other of the symptoms noted in the group heading—symptoms commonly seen in all forms of refraction error, and occurring quite as frequently in cases of usual astigmatism, and even in simple hypermetropia and myopia. In two of the cases evidence of general disease required appropriate constitutional remedies, and in one hysteria was a strong factor. It is again noteworthy in four of the cases that the addition of a weak cylinder to a spherical glass which previously had been worn for reading produced a result not attained by the former correction, and that in six of the examined eyes the astigmatism was corrected by a 0.25 cylinder.

3. Cases characterized by various types of headaches aggravated by the use of the eyes.

Case 1. Peri-ocular Pain and Occipital Headache.—L. M., a woman aged 56; in delicate health; nausea and backache; peri-ocular, frontal and occipital headache. Grey-red discs, distended lymph sheaths, areas of fine, yellowish-white spots in macula. Urine slightly albuminous and containing hyaline tube casts.

O. D. + .25s \bigcirc + .90c axis H $\frac{1}{15}$. O. S. + .50s \bigcirc + .75c axis H $\frac{1}{5}$. The presence of Bright's disease in this case rendered it impossible to judge of the value of the glasses in relieving the headache.

Case 2. Nocturnal Headache.—B. C., a woman aged 40; general health good; misty vision and a feeling of fulness in head; nocturnal headaches after evening use of eyes; discs too capillary, and faint retinal haze.

O.D. + 1.25 \bigcirc + .90 axis 10 $\frac{1}{15}$. O.S. + 1.25 \bigcirc + .50 axis 165 $\frac{1}{15}$. Entire relief resulted.

Case 3. Severe Supraorbital Neuralgia.—D. W., a man aged 61; chronic rheumatism; gouty ancestry; severe supraorbital neuralgia; failing vision especially in O.D.

O.D. + 1.5 \bigcirc + .50c axis 15 $\frac{2}{30}$. O.S. + 1.5 \bigcirc + .50c axis H $\frac{2}{20}$. In the right eye greyed disc and unduly prominent scleral ring; field contracted. In left eye fundus normal except broadening of the scleral ring. Reading power improved; supraorbital neuralgia not relieved; this was probably rheumatic.

Case 4. Severe Frontal Headache.—J. M., a girl aged 17; general health usually good; slight menstrual derangement; frontal headache severely aggravated by eye use. Fundus normal.

O.D. + 1.25s \bigcirc + .60c axis H $\frac{2}{20}$. O.S. + 1.25s \bigcirc + .60c axis 165 $\frac{2}{20}$. These glasses afforded entire relief except during the menstrual epoch when considerable asthenopia appeared.

Case 5. Frontal Headache.—S. W., a young man aged 18; general health good; no complaint except frontal headache after reading or study; discs normal in color; scleral rings unduly broad; veins and lymph sheaths distended.

O.D. + 1.5 \bigcirc + .90c axis H $\frac{1}{12}$. O.S. + 1.5 \bigcirc + 1.25c axis 165 $\frac{1}{12}$. The result was entirely satisfactory.

Case 6. Right-sided Headache, Neuralgic in Type.—M. D., a woman aged 59; delicate health, the result of a long standing *fistula in ano* and a severe attack of typhoid fever; cannot read with any comfort, severe headache the invariable result; is wearing simple sphericals.

O.D. + 1.5 \bigcirc + .50c axis H $\frac{1}{15}$. O.S. + 1.25s \bigcirc + .25c axis H $\frac{1}{15}$. Much relief followed the use of the new glasses.

Case 7. Peri-orbital Pain and General Headache.—P. D. E., a woman aged 30, feeble general health without definite disease; severe general headaches and photophobia aggravated by eye use. Oval discs, nasal edges veiled, choroids woolly.

O.D. + .25s \bigcirc + .50c axis H $\frac{1}{15}$. O.S. + .50s \bigcirc + .50c axis H $\frac{1}{15}$. Greatly improved in all respects without the use of general medication.

Case 8. Constant Temple Headache.—M. D. G., a boy aged 18, general health good; constant temple headache with some lachrymation. Oval, over-capillary discs, with veiling of the nasal edges.

O.D. + .50s \bigcirc + .50c axis 16 $\frac{2}{15}$. O.S. + .50s \bigcirc + .25c axis 165 $\frac{2}{15}$. Satisfactory results.

Case 9. Constant Left sided Head Pain.—H.

R. C., a man aged 90, general health perfectly good; dull ocular pain and sharp left-sided headache, with some photophobia. In the right eye round disc, color good, but scleral ring too plainly marked; left eye, oval disc, gray, veins and lymph sheaths full.

O.D. + .90s \bigcirc .50c axis H $\frac{2}{20}$. O.S. + 1.5 \bigcirc + .50c axis 165 $\frac{2}{20}$. There was entire relief.

Case 19. "Sick Headache."—M. A., a woman aged 50, good general health; numerous sick headaches brought on by eye use, with unsatisfactory reading power. Oval, healthy discs.

O.D. + 1.50s \bigcirc + .50c axis 150 $\frac{2}{20}$. O.S. + 1.50s \bigcirc + .50c axis 30 $\frac{2}{20}$. These glasses afforded relief when combined with proper reading lenses.

Case 11. Occipital Headache.—S. M., a woman aged 47, cardiac asthma from mitral disease, has had rheumatism; severe occipital headache aggravated by eye use, ordinary convex sphericals useless.

O.D. + .50s \bigcirc + .60c axis 15 $\frac{2}{20}$. O.S. + .50s \bigcirc + 1.c axis 165 $\frac{2}{20}$. The occipital headache had disappeared when the patient was last seen.

Case 12. Occipital Headache.—J. H. T., a man aged 38, general health good; has worn glasses for four years (+ 1.5); recently complains of not seeing well and pain in the occiput after eye use. In each eye an oval disc, with a slight patch of choroiditis at the outer margin; central lymph sheaths full.

O.D. + 1.50s \bigcirc + .50c axis H $\frac{2}{20}$. O.S. + 1.50s \bigcirc .50c axis H $\frac{2}{20}$. The result was perfectly satisfactory.

Case 13. Severe Brow Pain.—M. L., a girl aged 16, slender, anæmic, occasional dysmenorrhœa; for two years has suffered with violent attacks of brow pain, slight ache being more or less constant, and the explosions of headache being severe enough to put the patient to bed. They were often noted on Saturday or Sunday. The ophthalmoscope reveals in each eye an oval optic disc, unduly capillary, and all the edges blurred by a hazy retina; in other words, a typical eye strain eye-ground.

O.D. + .75s \bigcirc + .60c axis 15 $\frac{2}{20}$. O.S. + .75s \bigcirc + .75c axis H $\frac{2}{20}$. These glasses, together with discontinuance of the studies, the administration of iron and occasional doses of bromide of lithium, revolutionized this girl. She is to-day practically free from headaches, or at least they come with great rarity. Her color has improved, her hæmoglobin has mounted to normal, and the eye-grounds have vastly improved. It should be noted, however, that with the glasses there was careful regulation of her habit of life, and the almost continuous use of iron in the form of Bland's pills.

Case 14. Severe General Headache.—H. F., a woman aged 30, from early childhood has been

subject to violent general headaches, considering herself fortunate if she passed a day without some pain in the head; this was invariably brought on in a violent degree by use of the eyes. In girlhood she was removed from school on this account. With this exception, there is no general disturbance. Curiously enough, her eyes were never examined. Each eye presented an oval optic disc of fairly good color, and no changes in the fundus.

O. D. + 2.75s \bigcirc + .50c axis H $\frac{20}{0}$. O. S. + 4.50s \bigcirc + .50c axis H $\frac{20}{0}$. Very marked relief followed the use of these glasses.

Case 15. Violent Headaches of the Migrainal Type.—A. J., a woman aged 50, had for years suffered with violent headache, worse in the eye, top of the head and back of the ear, generally one-sided, without positive prodromes, and sometimes followed by nausea; has tried all manner of medication, and on the examinations of very competent general practitioners was pronounced to be free from constitutional reasons for such headache. She is, however, an anæmic woman, slender, and readily worried, having met with considerable business reverses. The eye-grounds were healthy; in each eye an oval optic disc of about normal color.

O. D. + .75s \bigcirc + .75c axis 30 $\frac{20}{0}$. O. S. + .75s \bigcirc + .75c axis 165 $\frac{20}{0}$. These glasses did not cure the headache; in fact, at the last account she was not relieved by them except as aids to reading. She was a peculiar, somewhat vain, old maid, and declined to wear the distance glasses. It is possible that had she consented to the constant use of glasses the result might have been better.

Case 16. Violent Temple and Brow Headache.—W. J., a woman aged 35, except for occasional attacks of gastralgia, probably has a symptom of one of the types of dyspepsia usually induced by imprudence in eating, is in good general health. She suffers from violent temple and brow headache, and is subject to excessive exacerbations of these pains. In each eye a slightly oval, unduly capillary optic disc; the retinas fairly good. She has worn + 4.50 without relief.

O. D. + 5.50s \bigcirc + .50c axis 15 $\frac{20}{0}$. O. S. + 7.50s \bigcirc + .60c axis 165 $\frac{20}{0}$. These glasses cured the headaches.

Case 17. Typical School Headaches.—A girl aged 13, in good general health, complains of brow pain at the end of each school hour, and that the eyes feel as if they were being pushed in. Oval discs, slight crescent and some retinal haze.

O. D. + 1.75s \bigcirc + .25c axis 150 $\frac{20}{0}$. O. S. + 1.75s \bigcirc + .25c axis H $\frac{20}{0}$. No headaches occurred unless she laid aside her glasses.

Case 18. Constant Headaches.—S. E. C., a woman aged 45, states that since her 15th year she has had constant headache, its chief location being in the brow and temple; she is fairly well

nourished without constitutional taint, but with a neurasthenic tendency and a habit of trying all manner of doctors. Remedies have proved unavailing in her headache; five graduated tenotomies have been done; these, she states, relieved for a time the headaches which now, however, are constant and severe. She wears for distance + .50 and for reading + 2.50. Each disc an oval, its surface slightly œdematous and all edges slightly hazy; numerous lymph reflexes.

O. D. + 1.5 \bigcirc + .25c axis 15 $\frac{20}{0}$. O. S. + 1.5 \bigcirc + .50c axis 165 $\frac{20}{0}$. After wearing these glasses for some time she states that they help her eyes but the headache continues to be present, although not so severe, in the brow and temple. She has undergone careful six-weeks rest-cure and is generally much improved.

Case 19. Violent Scattered Head-pain; No Relief from Drugs.—A. B. H., a man aged 35, has had no serious illness since his 17th year, when he suffered from scarlet fever, but had a slight heat stroke eight years ago. He is very bilious; works in tobacco, but uses the drug moderately. His present trouble began five years ago in the form of shooting pains in the head, previous to which time he suffered from sick headaches. These pains located themselves in different spots, and are intensely violent and neuralgic in type. In each eye a round disc with some patches of white over the central vessels; rather full veins, but otherwise normal eyegrounds.

O. D. + .50c axis 150 $\frac{20}{0}$. O. S. + .37c axis 30 $\frac{20}{0}$. With the exception of a few doses of croton chloral hydrate the patient had no remedies after the prescription of these comparatively weak cylinders, and yet the relief was almost immediate and has continued ever since, the treatment having been instituted many months ago.

Case 20. Periorbital Pain.—G. P. S., a woman aged 49, rather delicate in constitution and yet without organic disease, complains of a peculiar pain, which is described as drawing in the brow and over the eye after reading and writing; this pain speedily produces nausea. In each eye an oval disc, the edges slightly blurred by hazy retinas.

O. D. + 2.5 \bigcirc + .25c axis H $\frac{20}{0}$. O. S. + 1.75s \bigcirc + .50c axis 150 $\frac{20}{0}$. These glasses combined with suitable presbyopic correction, were of great assistance, and reading and writing is now done with comparative ease, although eye endurance is not great. The previous correction was similar except that the astigmatism had been unnoted.

Case 21. Vertex and Occipital Headache.—M. J. A. a woman aged 51, is excessively anæmic, having had two attacks of hæmatemesis, in the last of which she nearly perished, probably depending upon ulcer of the stomach; she is deaf from catarrhal disease of the Eustachian tubes.

Numerous muscæ float before each eye. In each the edges of the disc slightly hazy, the choroid a little woolly, a few yellowish dots scattered through the eyeground but no hæmorrhages; the color of the disc pallid.

O. D. + 1.75s \bigcirc + .50c axis H $\frac{2}{0}$. O. S. + .75s \bigcirc + .60c axis 15 $\frac{2}{0}$. These glasses and a suitable presbyopic correction combined in bifocals, may have produced some relief, but the eyes were far from comfortable and the eye endurance exceedingly limited. It could not reasonably be expected that any great impression would be made in a woman whose hæmoglobin was so much below the normal from excessive hæmorrhages.

Case 22. General Headache.—A. H. T., a woman aged 30, always complained of weak eyes; never has had any severe illness. In childhood fell upon the head, without, however, producing a fracture; in early childhood had convulsions attributed to indigestion; for years has suffered with violent headaches beginning in the eyes, becoming general and ending in nausea. Drugs have palliated but done nothing more. In each eye the disc is oval, the surrounding retina hazy and the surface of the papillæ a little woolly.

O. D. + .75s \bigcirc + .25c axis 30 $\frac{2}{0}$. O. S. + .75s + .25c axis 150 $\frac{2}{0}$. After wearing these glasses for several months she reported an entire absence, with one exception, of headaches.

Case 23. Brow Headache After Study.—F. R., a boy aged 14, had diphtheria and scarlet fever in infancy, but is perfectly well now; complains of the ordinary brow pain after evening study, but so common in children; occasionally the headache becomes general. With the exception of unduly full veins which are slightly tortuous there are no changes in the eyeground.

O. D. + 1.25s \bigcirc + .50c axis H $\frac{2}{0}$. O. S. + 1.50s \bigcirc + .25c axis H $\frac{2}{0}$. The relief was complete.

Case 24. Severe Occipital Headache.—E. M., a woman aged 45, has had a complication of troubles which may briefly be stated as double vision from paralysis of one or other of the ocular muscles (it is not known now which) followed by Bell's palsy, the remains of which are still apparent, and having had as her most recent illness a severe miscarriage, one other having also occurred, in all instances the probable result of specific infection. There were no changes in the eyeground to indicate constitutional disease and she sought relief for violent occipital headache.

O. D. + 1.s \bigcirc + .50c axis 30 $\frac{2}{0}$. O. S. + 1.s \bigcirc + .75c axis 150 $\frac{2}{0}$. This, or a correction very nearly like it, together with a suitable presbyopic correction, she had worn for some time and with some relief, but the headache continued. The correction was gone over again and a slight change made in the cylinders, without much relief to the headache, which also did not yield to this specific treatment. A thorough examination

of the urine revealed some albumen and here and there a tube cast. Under proper diet, combined with Basham's mixture and small doses of bichloride of mercury, the occipital pain disappeared. In this instance it is evident that the astigmatism was not the cause of the pain, and that its correction consequently yielded no result.

Case 25. Violent General Headache.—G. S., a woman aged 31, for four years has suffered with violent headaches, somewhat relieved but by no means set aside by glasses which properly correct her astigmatism. One year ago she had nervous prostration, and has suffered at times with rheumatic pains in the shoulders; otherwise the health appears to be good. In each eye there is an oval, distinctly gray optic disc.

O. D. + 3.s \bigcirc + .75c axis H $\frac{2}{0}$. O. S. + 2s. \bigcirc + .50c axis H $\frac{2}{0}$. Three months after the correction the patient reported that she had scarcely any headache, although previous to that time it was rare to go a day without one. It is interesting to note that in this case she previously wore a correction of her astigmatism, just half of the amount having been ordered, with almost no correction of the hypermetropia and with no good result.

Case 26. "Sick Headaches."—E. L. S., a woman aged 45, some years ago had typhoid fever; since then has been well, but has lost much sleep by nursing; wears simple sphericals which are not satisfactory; always has had much headache, which begins over left eye, spreads through head to occiput, and also has many "sick headaches," beginning in the same way. The optic discs are pallid, with marked scleral rings surrounding them; otherwise no changes.

O. D. + .60s \bigcirc + .25c axis H $\frac{2}{0}$. O. S. + .60s \bigcirc + .25c axis H $\frac{2}{0}$. Three months after the use of these glasses, together with the necessary convex addition for reading, which was combined with a 2.5° prism base in, the patient reported herself much better.

Case 27. Severe Frontal Headache.—W. J. S., a woman aged 48, with the exception of considerable nervousness and ready succumbing to fatigue, is in good general health. She has worn glasses for twenty-three years, always simple sphericals, and for years has suffered with violent pain beginning in the forehead and passing to the occiput, coming in spells sometimes lasting for two days at a time. These headaches are induced not alone by reading or eye work, but by any fatigue. There are faint striæ in the far periphery of each lens. The discs are oval, of good color, maculæ normal; some filling of the central lymph sheaths.

O. D. + 5.s \bigcirc + .75c axis H $\frac{2}{0}$ —. O. S. + 5s. \bigcirc + .90c axis 15 $\frac{2}{0}$ —. Three months later this patient reported herself better in every way, having had only one headache and no eye pain.

Case 28. Ordinary School Headaches.—B. B., a

girl aged 16, has worn glasses for four years, very much an under-correction of her refraction error and without note of the astigmatism. She is subject to tonsillitis, has some indigestion and a great many comedones on her face, probably connected with the indigestion, perhaps with menstrual disturbance; complains of indistinct vision and headache coming on after school, with inability to maintain accurate close vision. In the right eye an oval disc, the surface a little woolly, and a slight crescent at the outer side. In the left eye an irregularly oval disc with distinctly mellowed edges and many lymph reflexes through the fundus.

O. D. + 2.5 \bigcirc + .12c axis H $\frac{2}{20}$. O. S. + 3.25s \bigcirc + 1.25c axis 15 $\frac{2}{20}$. Several months after this correction was ordered marked relief was reported.

Case 29. Occasional Brow Pain; a Good Deal of Nervousness.—J. J. R., a woman aged 35, was glassed six years ago, and wears a correction similar to the one given below, but slightly under the total amount of astigmatism; declares that she is in good general health, a report which is confirmed by her physician; complains of limited eye endurance, headache over the brow and pain darting in the right eye; cannot use the eyes at night, and "gets nervous from her eyes." In each eye a typical eye strain appearance, namely: slightly veiled edges of the disc, full lymph sheaths, fine oedematous haze of the retina.

O. D. + 2.5 \bigcirc + .90c axis 165 $\frac{2}{20}$. O. S. + 1.75s \bigcirc + .90c axis H $\frac{2}{20}$. A month later she reported progress, but still complained of some pain and the nervous feeling when she used her eyes. The eye-grounds were still very irritable.

Case 30. Post-ocular Headache.—A. A., a woman aged 38, has worn glasses for ten years, recently having a correction closely similar to the one given below, but also an under-correction; she is closely confined at her business and is in poor general health from lack of exercise, without any definite illness; is very nervous. The eyes feel strained, and their use brings on severe pain situated behind the orbit. In each eye a round disc with a shallow excavation, the papilla being surrounded by a somewhat hazy retina.

O. D. + 2.5 \bigcirc + .50c axis 30 $\frac{2}{20}$. O. S. + 1.75s \bigcirc + .75c axis 150 $\frac{2}{20}$. These glasses were a help, but a vacation, complete rest, and some general medication were also used.

Case 31. Temporal Headache; Ocular Pain.—A. R. L., a man aged 29, uses his eyes a good deal; is a trained athlete and in general good health; formerly he was subject to vertigo which now has entirely subsided; at present complains of pain in the eyeballs nearly constant, and when headaches come on, which is not infrequent, the pain is situated in the temples. In each eye an oval hyperæmic optic disc, the eyegrounds showing superficial choroidal disturbance.

O. D. + 1.25s \bigcirc + .25c axis 165 $\frac{2}{20}$. O. S. + 1.25s \bigcirc + .25c axis 15 $\frac{2}{20}$. These glasses appear to have given comfort thus far, but the eyegrounds are far from being in good condition and rest has been enjoined.

In these thirty-one cases various types of headaches occurred, which, when due to eye-strain owing to the existing error of refraction, were relieved promptly by the correction except when the pain had evident origin in some constitutional condition, namely, in cases 1 and 3; and when, as in cases 15, 18, and 29, although no exact constitutional reason for the headache was ascertained, the general system probably was at fault, or sufficient time for the irritability of the eyegrounds to subside had not yet elapsed. In other words, the relief was exactly the same as that which is afforded by the correction of the ordinary errors of refraction associated with headache. It did not seem in any of the cases that the headache was more severe than that often noted in cases of astigmatism according to the rule, nor was there in any case marked general disturbance, as the apparent result of the eye-strain, except, perhaps, in case 7, where a feeble young woman improved greatly in all respects without the use of any general medication. In several cases general tonic medication was employed in addition to the optical therapeutics—a precaution often advisable as an adjunct in the treatment of "eye-strain" headaches. The ages of these patients varied from 13 to 61 years.

Four cases characterized by ocular changes—incipient cataract, with or without headache; and glaucoma.

Case 1. Simple Chronic Glaucoma.—S. E., a woman aged 50; has had much mental worry, otherwise no illness; dim vision in the right eye for several months; frequent changes in glasses; periods of obscuration of vision; no headache. Right eye, round disc excavated to margin, especially deep above and to nasal side, buff-colored rim with halo all round. T. plus 2. Left eye, round disc, small central excavation; veins full and pulsating. Anterior chamber in both eyes shallow; the nasal field in O. D. absent; in O. S. contracted.

O. D. + 2.5 \bigcirc + .60c axis 15 $\frac{2}{20}$. O. S. + 2.25s \bigcirc + .60c axis H $\frac{2}{20}$. Twenty months later the central vision in O. D. was $\frac{2}{40}$; in O. S. $\frac{2}{20}$. The patient has used continuously eserine. The field of vision has not materially changed.

Case 2. Simple Chronic Glaucoma.—A. H. D., a woman aged 65; easily worried; a poor sleeper; has chronic dyspepsia; obscured vision in the right eye above the horizontal line; pain in the back of neck; many changes in glasses. In the right eye a narrow anterior chamber; nerve horizontally oval; complete, shallow, glaucomatous cup and halo; T plus 1. In the left eye oval

disc; partial excavation; halo-like band. In the field of the right eye there was complete loss of the upper and inner quadrant; in the left contraction of the lower inner portion.

O.D. + .50s \bigcirc + .50c axis $15 \frac{2}{0}$. O.S. + .50s \bigcirc + .50c axis $165 \frac{2}{0}$. Iridectomy has been done on the right eye in this case, with good result.

Case 3. Incipient Cataract; Ocular Pain.—C. S., a woman aged 70; well preserved; general health, except for rheumatism, good; unsatisfactory reading glasses—simple convex sphericals; eyes pain. Oval discs; sharp scleral rings; choroids fair; striæ in the anterior cortices.

O.D. + 2.50s \bigcirc + .75c axis $15 \frac{1}{2}$. O.S. + 2.50s \bigcirc + .60c axis $165 \frac{1}{2}$. The result was increased comfort to the patient.

Case 4. Incipient Cataract; Occipital Headache.—S. A., a man aged 54; is the subject of muscular rheumatism and occipital headache; eyes readily tire at close work. Irregularly oval, gray discs; sharply marked scleral rings; fine, dust-like opacities in the periphery of each lens.

O.D. + .25c axis $15 \frac{2}{15}$. O.S. plus .25c axis $165 \frac{2}{15}$. These cylinders, incorporated with suitable convex sphericals for reading purposes, gave great satisfaction. Iodides, however, were ordered.

Case 5. Incipient Cataract; Occipital Headache.—W. W. G., a woman aged 54; imperfect health, although complexion ruddy; asthma (renal?); occipital headache; trigeminal neuralgia; reading glasses unsatisfactory; many follicular granulations in the conjunctival cul-de-sac. Oval, gray discs and fine striæ in the anterior cortex of each lens; albumen, hyaline and granular casts in the urine.

O.D. + 2.50s \bigcirc + .25c axis $H \frac{2}{0}$. O.S. + 2.5s \bigcirc plus .25 c axis $165 \frac{2}{0}$. The result of the change of glasses in this case was at last accounts not a satisfactory improvement. The local condition of the conjunctiva precluded the possibility of any eye work.

Case 6. Incipient Cataract; Frontal Headache.—B. C. G., a woman aged 60; general health moderately good; subject to "sick headaches;" at times bilious; urine normal; eye pain with sharp frontal headache caused by reading; glasses—simple convex spherical—not satisfactory. Small oval discs with yellowish dots in the macula; many shoots in the periphery of each lens.

O.D. plus 1.75s \bigcirc plus .90c axis $150 \frac{2}{0}$. O.S. plus 2.5s \bigcirc plus .50c axis $60 \frac{2}{0}$. Distinct relief has followed the new correction. The patient, however, has taken alternately iodide and bromide of potash, and strychnia.

Case 7. High H As.; Incipient Cataract.—T. A. H., a woman aged 68; general health moderately good; sciatica at times and occasional

attacks of bronchitis; convergent squint since childhood; seeks advice for improvement in vision; wears sphericals only; no headache. Oval, rather grey-red discs with mellow margins. Incipient cataract in each eye.

O.D. plus 2.50s \bigcirc plus 2.c axis $150 \frac{2}{40}$. O.S. plus 4.s 1.50c axis $165 \frac{2}{30}$. The improvement in vision, which was considerable, afforded the patient great satisfaction.

Case 8. Incipient Cataract; Pain in the Occiput.—E. C., a woman aged 61, has a mitral murmur and complains of pain after reading, sewing and the like, with some smarting and burning of the eyelids and pain in the occiput. In each eye an oval, distinctly gray optic disc. In the right eye the lens hazy, in the left striæ in the anterior cortex.

O.D. plus 4.50s \bigcirc plus .75c axis $H \frac{2}{0}$. O.S. plus 4.50s \bigcirc plus .25c axis $H \frac{2}{0}$. These glasses afforded her considerable relief, although prolonged reading still produces some burning in the eyelids.

Case 9. Incipient Cataract; Vertigo; Occipital Headache.—J. V. B., a woman aged 58, suffers from chronic indigestion and vertigo of such a type that the tendency is to fall forward; occasional attacks of severe headache in the occiput; heart and kidneys normal. In each eye an apparently healthy optic disc, except for undue broadening of the scleral ring. Large flocculent opacities in the anterior cortex of each lens, not yet encroaching upon the pupillary space.

O. D. plus 1.s \bigcirc plus .50c. axis $H \frac{2}{5}$. O. S. plus 1.s \bigcirc plus .50c axis $H \frac{2}{0}$. These glasses afforded relief, but it should be stated that the patient was also under treatment for the chronic indigestion, and no doubt the regulated diet and medicinal measures were potent factors in relieving the vertigo. The headache appears to have been due to uncorrected astigmatism. The patient has not reported quite lately, and the present result is unknown. It is an interesting fact that through the distance glasses there was orthophoria for the distant point; without them a slight right hyperphoria.

Case 10. Incipient Cataract; no Headache.—J. E. W., a woman aged 70, complains of no headache, but some slight pain in the eyeballs; uses her eyes incessantly as an artist doing the finest kind of painting. With the exception of some dyspepsia and a recent attack of influenza, the general health is good. In each eye there are striæ in the anterior cortex, radiating irregularly towards the pupil. Each disc is oval, gray, and its central lymph sheath full. The maculas are normal.

O. D. plus 1.25s \bigcirc plus .75c axis $H \frac{2}{30}$. O. S. plus 2.s \bigcirc plus .25c axis $H \frac{2}{30}$. The patient expressed satisfaction with the glasses.

Case 11. Incipient Cataract; Slight Conjunctivitis.—W. T., a man aged 62, in good general health with the exception of an attack of influenza, from

which the convalescence was slow, complains that the right eye inflames, the vision is dim and the glasses not clear; there is no headache. In each eye an oval disc, with undue broadening of the scleral ring, and the surface distinctly gray-red. In each lens small opacities down and in, in the anterior cortical, and the circle surrounding the nucleus slightly hazy.

O. D. plus .50s \bigcirc plus 1.25c axis H $\frac{2.0}{2.0}$. O. S. plus .90c axis 150 $\frac{2.0}{2.0}$. These glasses, together with simple sphericals, were ordered. The patient appeared to see with satisfaction, but complained still of irritation, the irritation so common in incipient cataract. It should be stated that there was also some squamous blepharitis.

Case 12. Incipient Cataract; Slight Vitreous Opacities; Occipital Headache.—J. A., a man aged 61, has had rheumatism, but with the exception of an attack of influenza in last October, which much prostrated him, has been in good condition. Since then has complained of floating spots before the right eye; he has some headache, chiefly in the occiput. In the right eye an oval, rather gray disc, fine haze in the vitreous and some striæ in the lens. In the left eye the conditions are similar, except no vitreous change was noticed. In each the retinas were hazy.

O. D. plus 1.25s \bigcirc plus .50c axis H $\frac{2.0}{2.0}$. O. S. plus 1.s \bigcirc plus .50c axis H $\frac{2.0}{2.0}$. The vision, however, was not clear, but seen through a slight mist, especially on the right side.

Case 13. Incipient Cataract; Pain in the Eyeballs.—J. B., a man aged 58, complains of some pain in the eyeballs, worse upon the left side; occasional brow ache. With the exception of a severe fall in the winter, which shocked him considerably but did not break any bones, there has been no noteworthy fact in his recent history. There is a slight haze around the perinuclear tissue of the lens, and a few fine opacities. Each disc is gray-red and contains a small central cup; in each macula a few fine yellowish dots.

O. D. plus 1.s \bigcirc plus .75c axis 150 $\frac{2.0}{2.0}$. O. S. plus 1.s \bigcirc plus .50c axis H $\frac{2.0}{2.0}$. These glasses were ordered and eye rest enjoined.

Case 14. Incipient Cataract; Some Throbbing in the Temples.—P. J., a man aged 68, considers himself to be in good general health; has some post-nasal catarrh; complains recently of some throbbing in the temples and insufficient eye endurance. In the right eye an irregularly horizontal oval disc, with slightly mellowed edges, and an atropic broadening of the scleral ring. There is superficial absorption of the choroidal pigment. In the left eye a rim of cortical opacities not yet encroaching upon the pupil, an oval disc which is very gray, and considerable epithelial choroidal change.

O. D. plus 1.s \bigcirc plus .60c axis 165 $\frac{2.0}{2.0}$. O. S. plus 1.50s \bigcirc plus .50c axis 15 $\frac{2.0}{1.5}$.

Case 15. Incipient Cataract; Headache and Nau-

sea.—J. A. T., a woman aged 55, six years ago suffered from nervous prostration, since then has been exceedingly nervous and suffered from flitting neuralgic pains; the nervousness is increased by reading, which also brings on headache associated with nausea. In the right eye there is a slightly gray, oval disc, without conus; small, fluffy opacities in the lens. In the left eye a similar oval disc and similar opacities, one spear-shaped stria passing towards the pupil space. Here and there in the choroid fine yellowish dots.

O. D. plus .25c axis H $\frac{2.0}{2.0}$. O. S. plus .50c axis 165 $\frac{2.0}{2.0}$. This was added to a suitable presbyopic correction and worn with a good deal of satisfaction—the patient, however, was put upon a restricted reading diet and given alteratives, chiefly in the form of bichloride of mercury.

The two cases of glaucoma are interesting in connection with Dr. Theobald's investigations as to the possibility of astigmatism being a factor in the development of this disease. They are further interesting because of the sharp central vision which was obtained by a correction of the astigmatism, and the influence of instillations of eserine. Both of these cases had been entirely unconscious of any serious eye trouble, and wondered why the frequent glasses which they purchased without consultation had never permitted them to see well or comfortably. The thirteen cases of incipient cataract were all, up to the present date, relieved by the addition of the cylinders to their reading glasses and the use of the correction for constant wear, with the single exception of the case associated with Bright's disease and granular lids, although in three of them no marked change for the better can be recorded. The importance of the correction of the entire error of refraction in incipient cataract has been dwelt upon frequently, especially in the able communication of Dr. S. D. Risley¹ upon this topic. It is, perhaps, worth while to emphasize the fact that the very presence of striæ in the lens determines an astigmatism against the rule, and that this should be searched for and corrected; and moreover, that these corrections should be the subject of reëxaminations at stated periods, because the refraction must necessarily change in eyes the lenses of which are swelling under the influence of cataract formation. With such correction, however, aided by alteratives and tonics much of the distress, either in the eyes themselves, or in the head, in the form of headache which not infrequently is associated with the early stages of cataract, may be alleviated. In this particular it is necessary only to refer again to Dr. Risley's paper. I would call attention to the good central vision which was obtained in the incipient cataract cases when the opacities were still in the periphery, and had not encroach-

¹ University Medical Magazine, March, 1889.

ed upon the pupil space. The ages of these patients varied between 50 and 70.

5. Cases characterized by various types of headache and associated nervous phenomena bordering on the type of the so called "reflex neuroses."

Case 1. Subjective Vertigo.—K. E., a woman aged 57; general health moderate; constipated and has hæmorrhoids; much eye pain, lachrymation and distress when at close work; for the past six months vertigo, sudden and subjective, when looking to the right. Discs gray and general absorption of the pigment epithelium of the choroid. Discs on a lower level than the maculas.

O. D. plus .25s \bigcirc plus 1.25c axis $15\frac{1}{15}$. O. S. plus .75s \bigcirc plus 1.c axis $165\frac{1}{15}$. The use of laxatives and regulation of the general condition did not relieve the vertigo; the glasses did.

Case 2. Occipital Headache; Melancholia.—D. S., a woman aged 48; general health good at present; occasional attacks of depression; has had two periods of melancholia once requiring sequestration; severe occipital headache; muscæ. Oval discs, rather gray, with a patch of choroiditis at the outer side of each.

O. D. plus .50s \bigcirc plus .50c axis $15\frac{1}{15}$. O. S. plus .50s \bigcirc plus .50c axis $165\frac{1}{15}$. These glasses afforded practically entire relief to the occipital headache. Owing to a high grade of insufficiency of the internal recti (exophoria), the corresponding reading glass was combined with prisms. There have been no attacks of melancholia since, and the woman's spirits are better, but the previous attacks of melancholia were so directly connected with grave disasters in the patient's immediate family that it would require a stretch of imagination to think that the eye-strain had had aught to do with their production.

Case 3. Marked Asthenopia; Typical Neurasthenia.—T. W., a woman aged 67; reasonable general health; marked asthenopia; cannot read for five minutes; easily depressed; has attacks of "night ptosis." Discs gray with visible scleral rings, and fibre layers of the retinas somewhat opaque.

O. D. plus 2.s \bigcirc plus .90c axis $H\frac{1}{15}$. O. S. plus 2.s \bigcirc plus .75c axis $H\frac{1}{15}$. Great improvement followed the use of these glasses, and while the asthenopia has not disappeared entirely, the eye endurance has markedly improved. With this improvement in eye-tire the previous depression of spirits has disappeared correspondingly. In this case there was also a high insufficiency of the internal recti, and prisms were combined with the reading glasses. The "night ptosis," or in other words, a contracture or dropping of the upper lid which came on during the night, especially if the eyes had been used during the earlier evening, making the patient desire to "prop up her lids," which she declared she could not voluntarily raise, is a curious symptom that I have

twice noted in patients suffering from asthenopia and allied ocular conditions, and who were as well the subjects of general hysterical manifestations.

Case 4. Frontal and Occipital Headache; General Nervousness.—P. G. J., a woman aged 53; chronic acid dyspepsia; eyes pain; cannot get glasses to suit; severe frontal and occipital headache follows eye use at close ranges, which results in attacks of general nervousness unfitting her for her ordinary duties. Fundus healthy, but the discs rather pallid.

O. D. plus 1.s \bigcirc plus .25c axis $H\frac{1}{15}$. O. S. plus 1.s \bigcirc plus .50c axis $H\frac{1}{15}$. The result in this case was very satisfactory.

Case 5. Fugitive Headache; Taciturn, Morbid and Moping.—J. H. L., a girl aged 13; beginning to menstruate; much headache unrelieved by general medication; photophobia; moping; unnaturally quiet, indisposition to any exertion. Discs with blurred edges, many lymph reflexes and hazy retinas.

O. D. plus 1.50s \bigcirc plus .75c axis $H\frac{2}{10}$. O. S. plus 1.50s \bigcirc plus .25c axis $H\frac{2}{10}$. Great relief followed, but the ocular treatment was associated with the use of iodides, bromides, iron and ergot. For a number of months she remained free from trouble, became more cheerful and pursued her ordinary duties; then a relapse took place, characterized especially by photophobia, following an attack of fever somewhat remittent in type. The case has again improved without recorection by the aid of bromide and ergot. The glasses were certainly one of the factors in relieving the general nervous symptoms in this case.

Case 6. Occipital Headache; Vertigo.—B. N., a man aged 46; general health good; recurring attacks of congestion of the bulbar conjunctiva; occipital headache; aggravated vertigo. Horizontally oval, gray discs with absorption of the pigment epithelium.

O. D. plus 1.s \bigcirc plus .50c axis $165\frac{2}{10}$. O. S. plus 1.s \bigcirc plus .25c axis $15\frac{2}{10}$. In this case the correction did not relieve the vertigo, or had not done so at the patient's last report some time since. The headache was relieved and the reading power increased, but otherwise the ocular therapeutics were not sufficient to subdue the chief symptom for which he presented himself—vertigo.

Case 7. General Headache; Insomnia.—G. M., a man aged 64; has chronic gout; severe headache increased by eye use; reading well nigh impossible; aggravated insomnia. Horizontally oval discs, gray; many yellow dots in the macula; urine normal.

O. D. plus 2.25s \bigcirc plus .50c axis $15\frac{2}{10}$. O. S. plus 2.50s \bigcirc plus .60c axis $165\frac{2}{10}$. Great relief, as far as the headaches were concerned, followed the use of this correction. The insomnia also was markedly relieved, but this has fluctuated

very much according to the man's general condition and the absence of presence of gouty symptoms.

Case 8. Right-sided Headache; Excessively Nervous.—E. F., a woman aged 34; has casts and albumen in the urine; severe right-sided headache with pain in the eyes, the use of which caused great nervousness; weeps readily; is depressed; globus not present.

O. D. plus 3.5 \ominus plus .25c axis 165 $\frac{2}{0}$. O. S. plus 3.25s \ominus plus .50c axis 15 $\frac{2}{0}$. There was entire relief of the headache, and with its relief the irritable nervousness was materially calmed. The patient was under treatment, also, for the coexisting Bright's disease, and it was difficult, owing to its presence, to determine which headaches belonged to eye-strain and which to the kidney disease, and also which one of these two factors was to blame for the excessive nervousness which amounted in its sum to manifestations closely resembling hysteria.

Case 9. Constant Morning Headache; Hypochondriasis.—W. L. H., a man aged 42; organs sound, but very nervous and despondent; thinks he has brain tumor and various other organic lesions; has had much mental worry; troublesome morning headache. Horizontally oval discs, rather gray. No change in the fields of vision.

O. D. plus .75s \ominus plus .50c axis 30 $\frac{2}{0}$. O. S. plus .50s \ominus plus .60c axis 165 $\frac{2}{0}$. There was gradual but decided relief of all symptoms; this, however, became complete only when a tonic regimen, systematic exercise and massage were added. The improved ability in reading and the disappearance of the morning headache were decided factors in relieving the mental depression.

Case 10. Occipital Headache; Vertigo.—D. M. J., a woman aged 44; general health poor; has chronic cystitis; has general vertex and occipital headache with a bruised feeling in the eyeballs; very distressing vertigo, especially when walking on the street. Slightly pallid discs with mellow edges, and fine, dust-like opacities in the anterior cortices.

O. D. plus .90c axis 15 $\frac{2}{0}$. O. S. plus .60c axis 165 $\frac{2}{0}$. These glasses afforded almost entire relief to the head symptoms with the exception of the vertex pain which persisted. The vertigo also disappeared. This is a good example of the fact that patients often suffer with two kinds of headache, the vertex headache being in this case almost certainly associated with pelvic disorders.

Case 11. Headache; Nervous Prostration; Vertigo with Nausea.—J. P., a woman aged 45; has had several attacks of nervous prostration; eye work causes nausea; general nervousness; this is apparent, especially when the eyes are used at distances midway between those which come into play in reading or close work, and at twenty feet or beyond. The fundus is normal.

O. D. plus .50s \ominus plus 1.50c axis 15 $\frac{2}{0}$. O. S. plus

1.50s \ominus plus .50c axis H $\frac{2}{0}$. The glasses in this case, which was seen in consultation, have afforded partial relief; certainly since their use the patient is said to be in a more satisfactory condition, and thus has reported herself, but is not entirely free from the symptoms above detailed. There appears to be no organic disease.

Case 12. Vertigo.—C. E., a woman aged 45; general health good; menopause not yet begun; recent severe and constant vertigo. Oval discs with broad scleral rings.

O. D. plus .37c axis H $\frac{2}{0}$. O. S. plus .50s \ominus plus .25c axis 60 $\frac{2}{0}$. The relief of the vertigo began with the use of the mydriatic, but the patient is also under general treatment.

Case 13. General Headache; Nausea; Muscular Twitchings.—S. C., a woman aged 29; complete nervous breakdown; muscular twitchings; insomnia; constant severe headache beginning as frontal and becoming general; eye-work causes nausea, increased headache, excessive nervousness and insomnia; organs sound. The fundus is normal except for some retinal haze.

O. D. plus 1.5 \ominus plus .75c axis 15 $\frac{2}{0}$. O. S. plus .50s \ominus plus 1.c axis 165 $\frac{2}{0}$. Relief began with the mydriatic, and up to the present time the patient is better. She, however, at the same time is having massage. The case is still under observation, and the date too soon to state positively the ultimate result.

Case 14. Sensation of Falling Forward when Walking in a Crowd; Confusion of Ideas.—M. P. F., a man aged 35; up to two years ago in good health; then an attack resembling epilepsy, but probably not epileptic; since then has had frequent attacks of mental confusion with a sense of falling forward, especially if walking on a crowded street; no general disease discovered. The fundus is perfectly normal, except a few yellow dots near maculas.

O. D. plus 1.5 \ominus plus .50c axis H $\frac{2}{0}$. O. S. plus 1.5 \ominus 50c axis H $\frac{2}{0}$. There has been only one attack since the patient was glassed. He is still under observation, which has extended over many weeks. He has taken no general medication.

Case 15. Severe Headache; Neurasthenia Globus Hystericus.—S. E., a woman aged 35; very gouty ancestry; vertex and occipital headache; marked neurasthenia; globus hystericus at times; keeps eyes closed. Fundus normal except for slight retinal haze.

O. D. plus .50c axis 15 $\frac{2}{0}$. O. S. plus .50c axis 165 $\frac{2}{0}$. All symptoms better.

Case 16. Frontal and Occipital Headache; Nervous Prostration.—C. S., a man aged 60; in poor general health; recent complete nervous breakdown forbidding, in large measure, any mental labor; unable to read satisfactorily; dull occipital and sharp frontal headache; recently had

an injury followed by typhoid symptoms (septicæmia?); media clear. Horizontally oval discs with mellow edges and deeper layers gray.

O.D. plus .50s \bigcirc plus .25c axis 15 $\frac{2}{3}$. O.S. plus .75s \bigcirc plus .60c axis 165 $\frac{2}{3}$. Distinct improvement in reading power and mental effort followed the use of this correction. It is quite evident in this case, however, that the nervous prostration was the result of the shock occasioned by the injury, and the patient is now undergoing a rest treatment.

Case 17. General Headache; Excessive Nervousness and Paræsthesia of the Face and Throat.—M. H., a woman aged 57; general health good and organs sound; for some years pricking sensations in the face and throat; occasional right-sided neuralgia; headache, and general nervousness, excessive after eye use. Oval, rather gray disc; a few spicules in the left lens.

O.D. plus 3.s \bigcirc plus 1.c axis H $\frac{2}{3}$. O.S. plus 3.50s \bigcirc plus .50c axis 30 $\frac{2}{3}$. Relief has followed the treatment in this case which, however, did not consist alone in the prescription of glasses.

Case 18. Trigeminal Neuralgia; Vertigo or Faintness after Reading.—A. G. W., a woman aged 56, fourteen years ago had ptosis of the right side, the remains of which are still apparent; general health now good, but complains of dim vision, easily tired eyes, sometimes a subjective vertigo, or perhaps more accurately, feeling of faintness, and very constant attacks of trigeminal neuralgia. There is much eye trouble in the family. The father is blind from glaucoma and the brothers and sisters are all hypermetropic and astigmatic to a considerable degree. The ophthalmoscope revealed oval optic discs with unduly broadened scleral rings; no cupping; the media clear; and the retinas fairly healthy.

O.D. plus .50s \bigcirc plus .60c axis 150 $\frac{2}{3}$. O.S. plus 1.s \bigcirc plus .60c axis H. $\frac{2}{3}$. These glasses relieved the faintness or vertigo, but had no influence upon the trigeminal neuralgia, which is probably connected with a gouty taint that runs through the family.

Case 19. Occipital Headache; Insomnia.—L. D., a man aged 49, complains of burning in his eyes after reading for a short time, also of brow and occipital headache; he has stubborn insomnia. He uses simple convex sphericals for reading. The patient for many years has had chronic diarrhœa and leads a very sedentary life. The ophthalmoscope reveals in each eye a pallid, oval optic disc, with clear edges and reasonably healthy retinas.

O. D. plus .50s \bigcirc plus .50c axis 165 $\frac{2}{3}$. O. S. plus .50s \bigcirc plus .50c axis H $\frac{2}{3}$. These glasses combined with a suitable presbyopic correction, were efficient in relieving the local inconvenience to his eyes and the headache, but had no influence upon the insomnia. This was in all probability connected with his anæmic condition which

in its turn was secondary to the chronic diarrhœa. So, also, the headache was not entirely relieved, depending also probably largely upon constitutional causes.

Case 20. Ocular Pain; Neurasthenia.—J. M., a man aged 61, has broken down from business strain and complains of unequal vision, sore eyeballs and pain in the head. In the right eye the disc is a large oval, pallid, the edges slightly mellow; in the macula are a few spots of choroidal degeneration; in the left eye a similar disc but no macular changes. Neither syphilis, albumen, sugar, nor demonstrable atheroma of the vessels was present.

O. D. plus 1.s \bigcirc plus .50c axis H $\frac{2}{3}$. O. S. plus 1.s \bigcirc plus .50c axis H $\frac{2}{3}$. These glasses appeared to prove satisfactory; the patient, however, was upon a very carefully regulated course of treatment including a modified type of the rest-cure with massage, electricity, etc., and consequently the effect of the glasses, except as aids to vision, cannot be estimated.

Case 21. Persistent Subjective Vertigo.—D. V. R., a man aged 56, who leads an active life, of full habit, a martyr to rheumatism, having had both endo- and pericarditis, and once an attack of peritonitis, for three months has had persistent vertigo. His present glasses, convex sphericals both for distance and reading, serve him a good purpose, but do not control the vertigo. In each eye an oval, gray-red optic disc, with mellowed and veiled nasal edges, exhibiting, in short, the appearances of a low grade neuritis.

O. D. plus .50s \bigcirc plus .75c axis 30 $\frac{2}{3}$. O. S. plus .50s \bigcirc plus .50c axis H $\frac{2}{3}$. The fields are distinctly contracted. There is right hyperphoria which fluctuates between one and four degrees. Diplopia is denied. These glasses afforded relief especially when combined with a prism base down before the right eye, but they did not cure the vertigo, which in this case was so evidently connected with circulatory disturbances. It is interesting, however, that they were distinctly a factor in such relief as the patient obtained.

Case 22. Vertigo and Pain in the Back.—F. P. C., a man aged 47, is compelled to use his eyes a great deal and complains of dizziness and pain in the back; his personal history is good; his digestion rather poor; he has had two severe illnesses in his previous life, once typhoid fever and once varioloid. Each optic disc was a vertical oval and contained a large physiological cup. There was some broadening of the scleral ring and slight retinal haze; in each macula fine yellowish dots; the urine, however, was normal.

O. D. plus .60c axis 165 $\frac{2}{3}$. O. S. plus .60c axis H $\frac{2}{3}$. Glasses may fairly be credited with having relieved the dizziness.

Case 23. Headache; General Neurasthenia.—D. W. M., a woman aged 60, of great activity, after prolonged mental strain broke down and

presented a series of neurasthenic symptoms, associated with severe pain in the back of the head, rather of the character of soreness than anything else, and a feeling described as a sinking away of the nerves. Both optic discs decidedly gray; otherwise no changes.

O. D. plus 1.75s \bigcirc plus .75c axis 15 $\frac{2}{3}$. O. S. plus 1.75s \bigcirc plus .50c axis 165 $\frac{2}{3}$. This and a suitable presbyopic correction, a month after its use caused the patient to report herself as doing well. It should be stated, however, that she was under careful general treatment and had undergone a prolonged rest-cure, and that any mental work was forbidden, or if it was undertaken was likely to produce a relapse.

Case 24. Fronto-occipital Headache; a Tendency to Fall Forward in Walking—A. J. Q., a woman aged 44, is in good general health with the exception of an acid dyspepsia and a great deal of general nervousness, probably induced by much sorrow in her family; cannot read or thread the needle, and has a good deal of fronto-occipital headache; the most aggravated feeling is that of falling forward when walking, probably a species of vertigo. In each eye an irregularly oval disc with a partially absorbed choroid ring. In the right eye some slight macular changes.

O. D. plus 3.s plus .25c axis H $\frac{2}{3}$. O. S. plus 3.50s plus .50c axis H $\frac{2}{3}$. Her symptoms began to improve from the time the mydriatic was employed.

Of the twenty-four cases just detailed vertigo was a prominent symptom in eight of them, which was either relieved or cured in six by the use of the glasses, but unaffected in two. Ocular vertigo, usually subjective, is a common and constant symptom in errors of refraction, so much so that the investigation of a case is quite incomplete without a study of the eyes. It does not seem likely that it is any more common in cases of astigmatism against the rule than in those where the refraction error is according to the rule. In an analysis of one hundred cases of ordinary far-sighted astigmatism, I think it is not very unlikely that eight of them, at the very least, would complain among other symptoms, of attacks of vertigo. Cases 14 and 24, in which there was a confusion of ideas and the sensation of falling forward, especially when walking in a crowd, might also be classed among the vertigos. In this case the refraction error appears really to have been the cause of the disease. I have seen two precisely analogous cases alleviated by the correction of a refraction error, the one of an ordinary myopic astigmatism of low grade, the other of a simple hypermetropic astigmatism. The mere feeling of falling forward as a symptom in errors of refraction, in common with all of my colleagues, I have seen many times, but in the three cases detailed it was associated with a confusion of ideas and pallor of the cheeks of

such a grade that at the original examination *petit mal* was suspected. Three of the cases were associated with hypochondriasis or melancholia. In the melancholic cases there could be no possible connection traced between the error of focus and the mental state. In the other two cases the glasses appeared to be one of the factors which brought about relief, although both patients were under systematic general medication. All the cases of neurasthenia and general nervousness—it is difficult to secure another expression to describe their indescribable sensations—were relieved by the use of glasses, just as the relief of eye strain, the result of the more ordinary types of refraction error, will produce a like result; but general treatment was not lacking when indicated. In one of the cases of insomnia it was not possible to determine whether this was the result of the headache, of eye strain or of the pain of gout; more probably, however, the latter. Insomnia, either simple in character, or the result of night headache, which in its turn is caused by eye strain, is often indirectly relieved by the proper correcting lenses. In the woman who suffered from paræsthesia the effect of the glasses cannot be determined definitely because, in addition to their use, other measures of treatment were employed.

It seems from an examination of these cases that the associated symptoms, with perhaps several exceptions, were not more severe than would be present in a like number of cases of astigmatism according to the rule. It is very far from the purpose of this paper to belittle in any way the correction of all types of errors of refraction, for the purpose of improving ocular health, for relieving headache, and for removing a possible factor that may depress general nutrition and be a cause of a reflex neurosis. But it certainly seems to the writer that in the present day there is a tendency to ascribe too much effect from the correction of refraction errors, and that because these exist the search for other causes of the associated symptoms at times becomes defective. When astigmatism against the rule exists, as Dr. Theobald has said, "We are warranted in correcting fully every particle of the defect which we can render manifest," and which should thus be rendered by the judicious use of an active mydriatic. Perhaps in no other instance do we find the strikingly good effects of adding very weak cylinder to the combination of lenses; in a number of the instances detailed in this analysis the question of comfort or discomfort having been obtained by the finding or failing to find so low a degree as plus .25 D. The balance of the ocular muscles has not been recorded in the present series of cases, although it was studied carefully as a matter of routine practice. The presence or absence of insufficiency introduces an entirely different element, and its exact relation to reflex

troubles of various types at present is being weighed in the balance. It is almost hackneyed to repeat what, however, sometimes is forgotten, that apparent insufficiencies, especially of low degree, disappear entirely after full and proper corrections, and with their disappearance the associated symptoms subside. This, as Professor Knapp has said, is one of the most thankful tasks which the practicing ophthalmologist performs. No where is it more necessary that this full and careful correction should be obtained than in examples of astigmatism contrary to the rule associated with low grades of insufficiency.

In conclusion, from these one hundred cases of astigmatism contrary to the rule certain interesting facts may be ascertained.

Age. The following table represents the number of cases according to the age:

First decade.	2 cases.
Second "	9 "
Third "	5 "
Fourth "	14 "
Fifth "	25 "
Sixth "	26 "
Seventh "	17 "
Eighth "	2 "

It will be seen, then, that more than half the cases occurred between the ages of forty and sixty.

Sex.—The majority of the patients were women, thirty-one males, and sixty-nine females.

The Degree of Astigmatism.—This varied from a 0.12 of a dioptré to 2. dioptries; the vast majority of the cases representing low grades of astigmatism .50 to .90.

It may further be concluded:

1. That the associated symptoms in these cases of astigmatism were not more severe than probably would be found in a similar number of examples in which the refraction error was according to the rule.
2. That useful results follow the correction of the least degrees of measurable astigmatism—results which are not obtained when this correction is neglected, and that the mere presence of so-called normal central vision according to the ordinary best standards, does not preclude the possibility of low degrees of astigmatism being present, which should be sought out and corrected.
3. That ocular health is conserved by such careful and thorough measurements of astigmatism, and hence indirectly general or so called reflex disturbances are alleviated, but that these latter should never be ascribed solely to the astigmatism simply because this is present, when they may be the evident pointings of Nature for relief to be obtained by measures directed toward an insufficient constitutional vice or insufficient nervous tone.
4. That the importance of low degrees of insufficiencies of the ocular muscles should not be

estimated until the effect upon them of complete correction of the astigmatism has been obtained.

5. That while no doubt in careful hands excellent results may be obtained by ophthalmometry and skiaskopy with prolonged mydriasis, the patient does not obtain the very benefit which is often most essential by the use of the mydriatic, namely, its local sedative influence and the complete rest which a prolonged paralysis of the ciliary muscle entails. The most perfect correction placed upon an eye the subject of symptomatic retino choroidal disturbance, fails to fulfil its function until the former has been subdued, and in its subjection prolonged mydriasis plays an essential part.

DISCUSSION.

DR. S. M. BURNETT, Washington, thought that astigmatism contrary to the rule was more productive of painful eye symptoms than when it was according to the rule. He had never been able to find a satisfactory explanation of this, but he has found that 0.5 D of astigmatism contrary to the rule will generally cause more trouble than 1.D of astigmatism according to the rule.

DR. SAVAGE explained his theories of asthenopia in astigmatism in which the meridians deviate from the vertical or horizontal position. This is especially the case if there is asymmetry between the meridians of the two eyes. He illustrated how this asthenopia is produced by the oblique muscles rotating the eye on their antero-posterior axis in their endeavor to make an oblique meridian correspond to a vertical or horizontal one.

DR. JACKSON said he had observed no further trouble from astigmatism against the rule than with the rule.

FUGITIVE BLOOD CORPUSCLES IN A
CASE OF LYMPHADENOMA.

BY J. H. WYTHE, M.D., LL.D., F.R.M.S.,
OF SAN FRANCISCO.

Microscopic examination of a drop of blood from the finger of a patient with lymphadenoma of long standing, revealed several interesting phenomena. The examination was made with a B. and L. homogeneous immersion objective, N. A. 1.43, and Zeiss' compensating eye-pieces, giving a magnifying power of 800 to 2,400 diameters. Lower powers are of little use in examining blood corpuscles. The drop of blood was placed upon a thin cover-glass, which was quickly dropped upon a slide and gentle pressure made upon it, so as to obtain a thin layer.

A little more than a year ago, in an essay read before the California State Medical Society, and published in its Transactions, I reported my observation upon the structure of normal blood

corpuscles, as seen in a solution of bichromate of potass. These observations showed a great difference in size, shape and activity among the corpuscles, corresponding, in all probability, to a variety of functions. Alterations of shape and structure were also seen, which were referred to post-mortem disintegration. The albuminoid hæmoglobulin was seen to ooze out of the matrix of the red corpuscle, to move about the field of view with amœboid motions, and to break up into smaller masses, which again subdivided into granules. Many of these changes were seen also in the specimen referred to in the present paper, although no reagent whatever was employed, proving satisfactorily that the appearances were not artificial products.

As might have been anticipated in a case of lymphadenoma, the white corpuscles were quite numerous. They were at first round or globular, and slightly larger than the average red discs, but in a little while began to swell and became an irregularly shaped network of convoluted fibres. The red corpuscles varied in size, some being about half the diameters of others. They were generally discoid, but of irregular contour, and gradually becoming more distorted. Some of them were considerably elongated and even branched, while others retained a more or less circular outline. Projections, or knobs, appeared as if growing on a majority of the discs, and were sharply defined in the field of view.

In addition to the red and white corpuscles, numerous bright, shining particles, or microcytes, were visible, some of which seemed to be nuclei of partially dissolved cells.

The first observations were made in the forenoon, but on account of professional duties the microscope, with the slide focussed on the stage, was covered with a bell-glass and allowed to remain until evening, when it was found that nearly all the corpuscles, both white and red, had disappeared, leaving only a slight stain of hæmoglobulin. Many of the shining microcytes still remained. The attention of Dr. Fisher was called to the phenomenon, as well as to the paleness of the few remaining red corpuscles, which in an hour more had all disappeared, except a few which had dried at the edge of the specimen.

Since the announcement by Dr. Prudden of the germicidal power of the blood serum, several European observers have made confirmatory statements, so that there is little doubt of the power of the lymph, or serum, to dissolve bacteria. May not this property account for the disappearance of the blood-corpuscles in lymphoid disease? If the shining nuclei be remnants of cells dissolved by the fluid lymph, it would seem that they are more resistant to its phagocytic power than the red and white corpuscles. These considerations emphasize the importance of investigating the vital changes occurring in the

white blood, or fluid circulating through the entire lymphatic and vascular system, and which, from its more general presence, must be of greater physiological and pathological importance than the corpuscles of the blood.

The cellular pathology inaugurated by the illustrious Virchow has had a brilliant history, and has added greatly to our knowledge, but recent microscopic research indicates the necessity of revision and change of statement relative to elementary biology. We can no longer regard the first living mass of matter as a cell, and the nucleus and nucleolus is not considered as important as formerly, while the tendency to the formation of living fibres in specialized networks is seen to be an elementary principle. It may be in the near future that we shall regard the white blood of any organized body as "the life thereof."

The patient referred to was ordered fifteen drops of syr. ferri et manganese iodidi in 3i of syr. of hydriodic acid, three times a day, and in a month's time there was evident reduction in the size of the tumor. The blood was again examined as nearly as possible under the same circumstances as before. The same diversities of size and appearance were observed in the red corpuscles. The white cells showed the same convoluted fibres, but in an hour's time disappeared. About three-fourths of the red discs became knobbed, irregular, or broke up into smaller globules, while the rest retained their circular outline. Many of them, in groups of two to five, became fused together into irregular masses. The most careful focussing, with varied obliquity of light, failed to find any line of demarkation between the corpuscles.

A much smaller number of the bright shining particles, or nuclei, were seen in the later specimen.

It was quite evident that the treatment had strengthened the resisting power of the red corpuscles, and they were not dissolved, and had reduced the number of separate bright nuclei.

TONSILLOTOMY.—We are justified in drawing the following conclusions:

1. That the only reported case of fatal hæmorrhage needs further corroboration before it should influence the usefulness of tonsillotomy.

2. That age is of all other conditions the most prolific cause of hæmorrhage.

3. That the early removal—that is, before the tonsillar tissue has become hard and fibrous—will reduce the probability of an alarming hæmorrhage to the ratio of one to all the reported cases of tonsillotomy.

4. That if the operation is skilfully performed with a tonsillotome, and the throat subsequently properly cared for, the probabilities of even a slight hæmorrhage are very small.—Fitzpatrick, *Lancet-Clinic*.

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SATURDAY, SEPTEMBER 3, 1891.

EPIDEMIC TYPHOID FEVER AT WATERBURY,
CONNECTICUT.

The last annual report of the Connecticut Board of Health, a volume of over 300 pages, just published, contains the history of an epidemic of typhoid fever in Waterbury, occurring in the midsummer of 1890. The special paper in the report, tracing the outbreak to "dairy typhoid," or to infection by typhoid-impregnated milk, was written by DR. HERBERT E. SMITH, professor of chemistry in Yale Medical College. DR. SMITH was detailed to investigate a sudden outburst of fever in June, 1890, of about fifty cases in a period of twenty-three days, limited to thirty-five families within the town. Not much success has, in this country, attended investigations intended to prove the relations of milk to typhoid fever; but in this instance we are presented with proofs of these relations that appear to be irrefutable. Although milk-typhoid has undoubtedly occurred in this country more frequently than has been generally known, there have been not a few unexplained epidemics of fever, whereof the chains of conditions and surroundings have been suspiciously similar to those discovered at Waterbury and at the Middlebury farm, whence the alleged infected milk was derived for the use of the families residing in one section of the town. The distinctly proven cases of milk-ty-

phoid have been, in other countries, sufficiently frequent and destructive to show that it is a reality and a dangerous foe to human health and life. In 1881, MR. ERNEST HART, the well-known editor of the *British Medical Journal*, and of the *London Sanitary Record*, read a paper before the International Medical Congress, in which he gave a brief account of not less than fifty outbreaks of fever, embracing over three thousand cases, that were caused by milk-infection. These epidemics had been the subjects of persistent and thorough investigation during a period of eight years or more prior to MR. HART's report. The greater number of these fifty epidemics were in England, and had been officially recognized and acknowledged. Since that time other cases of milk-infection have been reported, but their gravity has been materially subdued by sanitary precautions. The dairies of England have, in late years, been placed under a vigilant inspection, so that errors of construction about dairies, and dangerous practices on the part of dairymen, have been reduced to a minimum. In the present case of the Waterbury outbreak, the investigator made some few inquiries regarding its possible causation by the water supply and drainage system of the parts of the town affected, but his results were negative. In regard to the milk supply the reverse was the result, for he early found significant hints of an infected dairy, which were abundantly confirmed as his inquiry progressed. As a starting-point, DR. SMITH felt that he had to contend with a far-reaching method of infection, for the reason that June is not one of the typhoid months, so to speak; in that region the most usual time for the appearance of cases of fever is in the early fall. He found that a certain dealer in milk supplied four-fifths of the families, living in two-thirds of the houses, where the disease occurred. This dealer probably served not more than 4 per cent. of the townspeople, with daily deliveries amounting to 600 quarts. His milk was obtained chiefly from three farms, concerning two of which there was absolutely no typhoidal history. One farm, however, had had not less than three cases of fever, and this was a source of one-quarter of the dealer's daily supply. It is probable that the milk from this dairy was contaminated both aerially and through the water used for the washing of cans. The sources of water on the farm were not in good sanitary condition, but a

bacteriological examination, made late in the month, did not discover the specific bacillus of EBERTH; the cow-yard and the milk-room presented conditions that were in several particulars favorable to the dissemination of infecting material or media.

At the time of DR. SMITH'S visits to the farm, he found the barn-yard very offensive from an accumulation of manure, which had not been removed for several weeks, owing to the farmer's illness, during that time, by typhoid fever; the yard was undrained and so situated as to hold ponded filth, several inches in depth, at its most depressed portions. The investigation failed to detect any gross contamination of the milk—the inquiry was begun too late to render this discovery probable—and it is not to be considered necessary to the making out of a strong anti-dairy argument, for as Dr. SMITH points out, it has been repeatedly shown that the specific contagium of typhoid fever, excreted in the stools, has ample powers of self-multiplication; and further, as WOLFHÜGEL, SEITZ and HEIM have demonstrated more recently, the article milk, whether sterilized or unsterilized, becomes an excellent culture medium for the bacillus typhosus. And it has been still further shown that, with a temperature not exceeding 55° F., the bacillus grows quite readily, and this was the temperature that was noted in the milk-room where the cans stood before leaving the dairy-farm. A pure water supply, above suspicion and amply protected from every form of sewage contamination, is a desideratum of the first moment, from the fact that the water used in cleansing the cans and other appurtenances is probably the readiest means of bringing the contagium from infected excreta into contact with the milk. Motives of policy, as well as humanity, alike point to the importance of having the purity of the milk and the cleanliness of all vessels, used in its preparation and transportation to the consumer, made as complete and perfect as possible. And it should be especially remembered in this connection that something more than an apparently pure water is required, for we may have a contaminated supply, even from sources of gross excrementitious pollution, without its yielding any evidence of impurity to our senses. It is further held by experts that, in the bacteriological study of milk and of water, it is not always possible to detect

the EBERTH'S bacillus, when a certain time has elapsed after the febrile outburst. Excrementitious contamination may be found at a late date, but to give the investigator the fullest and best opportunity for identifying the bacillus he should be called into the examination at the earliest practicable period of time. The author of the report closes with a special admonition as to the position of cesspools, privies, etc., on dairy farms, saying that they "should be properly located, properly constructed, properly cared for, and their proper use should be insisted on, because of the direct dangers of the contamination of the milk by those whose duty it is to take care of it." The ordinary conduct of the majority of our dairy-farms ignores all probability, if not possibility, of domestic pollution, and a lesson might be read to dairymen, from the Waterbury incident, to show that three cases of fever, one of them fatal, may arise upon the dairy-farm itself concurrently with the fifty cases or more which visited the townspeople. The typhoidal dairy is dangerous to its own residents not less than to its customers.

THE PASTEUR TREATMENT OF HYDROPHOBIA.

Among the many interesting and valuable papers presented at the Seventh International Congress of Hygiene and Demography recently held in London, the one presented by Dr. E. ROUX, one of PASTEUR'S principal co-workers, deserves special mention.

PASTEUR'S treatment of hydrophobia consists in producing, during the period of incubation of the disease, an artificial immunity in the person bitten by a rabid animal. This is accomplished by inoculating the individual on successive days with virus of different degrees of activity, commencing with a very attenuated virus and using on each succeeding day a virus of greater intensity.

The virus is obtained in the following manner: With the most complete antiseptic precautions, a rabbit is trephined at the back of the skull, and a few drops of the cerebro-spinal fluid of an animal suffering from rabies is injected under the dura mater. The piece of bone removed is then returned and the wound closed up. The wound heals rapidly and after a certain length of time, a week, the animal sickens and in three days more

dies of distinct hydrophobia. The cerebro-spinal fluid is used for inoculation in preference to any other fluid of the mad animal, because no other poison than that of hydrophobia produces such effects. Immediately after the death of the animal the spinal cord is removed with antiseptic precautions, and suspended in an aseptic flask containing some solid caustic potash, whose hygroscopic properties enable it to dry the air of the flask. When first removed the cord contains a virus of high but constant virulence, but gradually loses this virulence during the drying process, and in 15 days the poison has completely disappeared. The cord is rubbed up with sterilized bouillon to make an emulsion of definite strength, and this emulsion is used for the inoculations of human beings. The virus of the 14 day cord, that is, the cord which has dried 14 days, is so weak that it can be injected without danger into the human subject, but it produces a certain degree of immunity and prepares that subject to receive the injection of the cord of 13 days. Each succeeding injection of a stronger virus increases the immunity of the individual until finally complete immunity is conferred. If this complete immunity is conferred before the virus introduced by the bite of the rabid animal has had time to develop, the patient is prevented from having hydrophobia. The details of the method will be better understood from the following table, which gives the plan followed at the Pasteur Institute in cases of ordinary bites. The table is well known, having been frequently published, but its consideration here will certainly not be without interest.

1st day—cord of	{	14 days, dose 3 c.c. of emulsion.				
		13	"	"	3	"
2nd "	"	{	12	"	"	3
		11	"	"	3	"
3rd "	"	{	10	"	"	3
		9	"	"	3	"
4th "	"	{	8	"	"	3
		7	"	"	3	"
5th "	"	{	6	"	"	2
		6	"	"	2	"
6th "	"	5	"	"	2	"
7th "	"	5	"	"	2	"
8th "	"	4	"	"	2	"
9th "	"	3	"	"	1	"
10th "	"	5	"	"	2	"
11th "	"	5	"	"	2	"
12th "	"	4	"	"	2	"
13th "	"	4	"	"	2	"
14th "	"	3	"	"	2	"
15th "	"	3	"	"	2	"

In cases of bites about the head, the period of incubation is often very short, so that it becomes

necessary to hurry the treatment, particularly during the earlier days. During the first two days four injections are given daily instead of two. In addition the treatment is continued longer.

The cases treated at the Pasteur Institute are divisible into three classes: first, those bitten by animals recognized by subsequent experiment to be suffering from rabies; second, those bitten by animals recognized by veterinary surgeons, to be rabid; and third, those bitten by animals suspected to be rabid. Throwing out the latter class altogether, still remain in the first two classes, 7,925 cases treated during the five years ending Dec. 31, 1890. DR. ROUX did not include the cases treated during the current year in his statistics because of the short time which has elapsed since their treatment. The number treated is sufficiently large to make conclusions based upon them of some value. It is impossible to say how many of the cases treated by PASTEUR would have escaped if they had not undergone his treatment, but it is known that the mortality among persons bitten by animals actually or presumably rabid, is 12 to 14 per cent., and it is fair to suppose that the mortality among PASTEUR's cases of the same type would not have differed materially, particularly when the large number of the cases is considered. But the mortality among PASTEUR's first two classes of cases was less than 1 per cent., the exact figure being 0.92 per cent.

The gravity of bites about the head is well known, the mortality in cases not treated being 80 per cent. Seven hundred and ten persons bitten about the head have been treated at the Pasteur Institute, and twenty-four have died, a mortality of only 3.38 per cent.

From such a showing it is impossible to avoid the conclusion that the treatment has been effective to a large degree. DR. ROUX asks, what one among all the methods of treatment known to medicine could claim to have fewer failures?

Have PASTEUR's detractors anything better to propose?

Most of the deaths among the persons treated, occurred within two weeks after the cessation of treatment, which shows that the disease had already commenced before treatment was begun.

In another class of cases the period of incubation is very long, the disease not developing until

months or years after the reception of the bite. In these cases the PASTEUR treatment may fail, because the immunity conferred by it is lost before the hydrophobia develops.

Great as has been the good accomplished by PASTEUR in treatment of hydrophobia, his greatest honor lies in the possibility which he has opened up of preventing other infectious diseases by conferring an artificial immunity. His glory is as great as that of JENNER.

THE SO-CALLED BICHLORIDE OF GOLD TREATMENT FOR INEBRIETY.

This subject was discussed at the Practitioners' Club of Chicago during the current week. A great diversity of opinion was found among the members upon the subject. Quite a number of the members referred to confirmed inebriates of their acquaintance who had been relieved of their infirmity at Dwight. As to the permanence of the cures effected, no one could express an opinion. One gentleman, whose professional duties brought him much in relation with inebriates, told of several cases of a return of the habit in individuals who had been apparently cured at Dwight.

The red cinchona cure for drunkenness was recalled. This plan of treatment had been loudly extolled by the daily press at the time that it was in vogue, and the same extravagant claims made for it, as are now being made for the so-called bichloride of gold treatment. And yet this plan is now practically abandoned, because found wanting.

As to the therapeutic measures employed at Dwight, it was the general belief that the remedies employed were strychnia and atropine, remedies long known to the profession as possessing a certain degree of usefulness in inebriety. It has not been shown that gold in any shape plays any rôle in the treatment, except as "coin of the realm" poured into the coffers at Dwight.

How then can the good results which are unquestionably obtained at Dwight be accounted for? In the first place, the patients are selected cases. They go with the desire to overcome their habit or disease, whichever it may be called; they are constantly under observation, the slightest infraction of the rules of the place is met with prompt dismissal, all the surroundings bear most

strongly in the right direction upon the patient, and the psychic element thus invoked is unquestionably the strongest factor in the cure. If now to this be added the well-known beneficial effects of such remedies as atropine and strychnia, it is quite likely that cures may be produced. But temporary cures are of little value, permanent cures are needed, and here come in the "Bichloride of Gold" clubs, whose influence in maintaining sobriety in the graduates of Dwight can not be overestimated.

For the good that is accomplished at Dwight we have nothing but words of praise; there is no honorable man but is gratified at the reclamation of a drunkard. All honor to the Bichloride of Gold clubs, for they are working in good faith. Can we say as much for the institution at Dwight? We have been informed by the late Secretary of the State Board of Health, that the manager of this institution was refused a license to practice medicine in Illinois.

It has been the experience of the profession that secret remedies are not used in good faith, and lose their efficacy when exposed to light. It seems impossible for the laity, and particularly the public press, to understand the position taken by the profession on secret remedies. No true physician will withhold from his fellows any discovery which he may make that will benefit humanity. To enjoy a monopoly, for financial purposes, is entirely foreign to the spirit of the medical profession, and is never tolerated by it. It invariably purges itself of members guilty of such acts. If the treatment at Dwight be what is claimed for it, it should be freely taught to the world, as the number of cases of inebriety which can be treated at the Dwight institute and its branches, is but a trifling percentage of the cases in the country, in the world. Let the laity compare the action of a secret holder of a remedy with the nobility of Pasteur, whose work on hydrophobia is considered editorially in this issue, and they will appreciate better perhaps, the professional objection to secrecy.

If the originator of this treatment will demonstrate to the profession that he can accomplish what he claims, honors without stint will be accorded him, and his finances would certainly suffer no diminution. But if the efficacy of his treatment depends entirely upon secrecy, it will certainly not be made public, and the world must content itself with the limited efforts of the institution at Dwight.

THE PRACTITIONERS' CLUB OF CHICAGO.

Last Monday evening the first meeting of this organization was held in the Palmer House. The number of gentlemen who answered the call of assembly was an even half hundred. The enjoyment and enthusiasm of the occasion was an omen of assured success. The purpose of the club was fitly designated as: A monthly gathering—a good dinner, reasonable hours, nominal expense, good fellowship, light discussions, no officers, a closer professional feeling.

Such comings together of men of kindred minds and pursuits, with laudable purposes, are always fraught with good. We are sure that every town or city with more than a dozen doctors in it should have such a club as this. In such meetings may be discussed a variety of themes which are not usually taken up in more formal society meetings, such as the relations of the medical profession to the public, and of the public to the medical profession; the furtherance of all interests pertaining to the common welfare both of the people and of the profession. At such meetings, with agreeable surroundings and face to face, united action, harmoniously brought about, is much more easily and better obtained than when acting separately, although for the same purpose. Besides, we all think better and more kindly of each other for having once a month sat with our ether limbs under the same mahogany, walnut or oak table.

The members of the medical profession in every city of a hundred thousand people should have their own home. They may be only able to rent a humble dwelling for such a purpose, but by all means rent until able to own, and there have a library, a reading and common sitting room, a dining room and kitchen. A fraternal spirit and union of hearts will there be knit together. Professional homes are promoters of peace and goodwill, and from them are sure to spring the benevolent sentiment that encourages the strong to care for and not step aside to crush out the life of the weak and perhaps unfortunate. In the cultivation of this spirit and sentiment strong men are made stronger, and their lives more loveable. Their angular points are smoothed down until they are polished as to on all occasions reflect the nobleness of soul that is within them, while the weak but deserving are held up and encouraged in practical ways.

A home is needed to bring about such desirable results. Once obtained, foster it with gifts as you would show your affection for a much loved child. Carry to it a book for its shelves, or the shelves to hold another man's book, a picture, a journal. The home may be a trysting place in which to leave a call for another to make.

The Practitioners' Club of Chicago and every similar organization needs a home and needs it badly.

"**IODOFORM DRACHMS TEN.**"—Dr. Edward Jackson, in the *Medical News*, treats of the difficulties he has experienced in weighing the testimonies of those who report exceptionally favorable results from certain special lines of treatment for immature cataract. He has been troubled by the "too rosy" reports of cases, which assert too much and give too little proof to satisfy the minds of others. He says he is reminded, by these illogical displays, of a recent paper read before a homœopathic society, narrating five cases—one of them in the person of an allopathic physician—in which great improvement took place after the use of "iodoform 3x." This is probably the foggiest therapeutic statement that has been seen by any of our readers within the past decade. To us it is painfully suggestive of an admixture of ignorance, incompetence and impudence, in equal parts.

AN OBSTETRICIAN'S GENEROUS OFFER.—The eminent French professor of obstetrics, Dr. Tarnier, does not forget the lowly village where he was born, named Arc-sur-Fille. He has observed with grief the diminishing natality of his nation, and has determined to give a practical expression to this feeling in a novel manner; he has promised a gift of one hundred francs to every family at Arc-sur-Fille which shall have contributed an infant to the population of France during the year 1892. This is an original way of causing married people to reflect on one branch of their duties in life, but the villages in question can have no reason to complain that they have not received a timely warning.

A PRINCELY GIFT.—The King of Italy recently celebrated a birthday and did himself no small honor by sending a munificent contribution to the city of Turin, which is just now struggling to raise a fund for the erection of a hospital for contagious diseases. His gift is quoted at \$160,000 lire, or about \$32,000.

FOREIGN CORRESPONDENCE.

LETTER FROM VIENNA.

During the latter part of the present century, Vienna has become one of the greatest, if not the greatest, medical centre of Continental Europe. Hence, the whole medical world naturally looks to that city for the latest, as well as the most useful revelations in medical science, in all the various specialties, for many of them are diligently cultivated in the Austrian capital; and one will notice here, as in Berlin and Dresden, that many practitioners announce their special line of practice by large gilded signs, conspicuously placed over their doors.

That this should be a great teaching centre for those having a speaking knowledge of German, one can easily comprehend; because its professors in the hospitals are mostly men of worldwide reputations, many of whom are well known as authors and operators. Besides, their great, colossal hospital, on the *Aller Strasse*, being practically the only general hospital for the city, with its million and a quarter of population, along with its numerous suburban districts, clinical material is massed there, and there are shoals of material for every conceivable specialty.

This immense hospital and its grounds cover at least ten acres. It is constructed on the same architectural plans as are all the principal public buildings here; their courts, museums and military barracks, *i. e.*, the group takes the form of a quadrangle, with a large court, or hollow square, of open space in the centre, with many walks handsomely sodded, and all sheltered by numerous large shade trees.

In Professors Billroth and Albert's departments, surgical clinics are held every morning, often commencing as early as 7 or half an hour later, in the morning. These large surgical wards are well filled with many interesting cases. Professor Billroth is one of those who have great faith in the efficacy of the radical operation for the cure of reducible hernia; and among the many cases which I saw in his spacious wards, which were treated for radical cure was one man of 50 years, who had two herniæ operated on simultaneously. The method lately employed by the eminent professor is Bassini's, of Padua. It is claimed for it, that its results are the most satisfactory and desirable; while on the other hand, not infrequently, in spite of every precaution, suppuration ensues in the wound, and often there is no inconsiderable sloughing of the aponeurotic, fibrous tissues.

In Professor Albert's service, hospital and ambulant, the radical operation is seldom undertaken, except in those cases of painful incarceration, or impending strangulation.

It is interesting here to note the difference in technique of operation, in the practice of these two distinguished teachers in the same hospital. With Prof. Billroth, the irrigator is almost never employed, main reliance being placed on vigorous asepsis, the free use of soapsuds, and the sterilizing oven.

With the one, all the assistants must wear heavy rubber clogs and rubber aprons to save themselves from a free

wetting, while with the other, their morning, polished calf boots are worn all through, and, with the exception of being now and then smeared with blood, are none the worse for it.

In one particular, however, they both agree; neither uses sponges of any description in ordinary operations, but depend wholly on pledgets of cotton or gauze, for wiping away effused blood.

A material called, I believe, "wood wool," is employed in Billroth's clinic, in its loose state, for scrubbing purposes. If made from hard, tough wood, a small handful of it, wetted and lathered, can be used much more expeditiously than any sort of brush ever devised. After being employed it is thrown aside. In its dry state, when cut fine, it makes an excellent felting or padding, and serves the triple purpose of support, protection from cold, and lastly, being as porous as a sponge, is unrivaled as an absorbent.

The use of Koch's lymph for surgical tuberculosis has been abandoned entirely in this institution, as also, I am informed, it has been pretty generally throughout Austria. This is very greatly to be regretted, for tuberculous disease seems to be the scourge of Germany. I was informed that, taking all the surgical cases together, young and old, fully 80 per cent. were in one way or another complicated with this disease; and indeed, from the great number of hunchbacks and cripples seen in the cities of this section, there can be little doubt that the truth has not been overstated.

Cocaine anæsthesia, as a local analgesic, is being largely employed here, for those operations in which no large nerve trunks are being divided, or bones cut through. Without question, when cocaine is applied skilfully, and its powerful analgesic properties are understood, it will be more largely employed, both to the advantage of the patient and the operator.

Iodoform gauze still holds its own, although one does not see the dry drug peppered over denuded surfaces, as was the custom in America—and I suppose among the Teutons—not long since.

It may be interesting to inquire what the great advantages of these hospitals in Continental Europe are, that Americans should pass by their own great cities, where every possible facility is given by eminent teachers, in the various post-graduate schools and hospitals, to enter cities, of the language of which many of them know nothing.

It may be said in reply, that travel broadens and develops the mind, and that these older countries are better equipped than ours for imparting an education, medical as well as any other; that their term of study is so much longer, etc. This latter has been particularly harped on lately, in America, by some who would extend the term of study so long that, when a student got through, he would be pretty sure to know nothing. And besides, if this precious privilege few but the sons of millionaires could compete. Dr. Lauder Brunton argued, at the late meeting of the British Medical Association, for an extension of the term of study, but failed, I believe, in convincing his audience on this point.

As a matter of fact, our system of teaching medicine

America is excelled by no nation in Europe. When our young men enter a medical school, it is not for the purpose of idling away three or four years in doing little or nothing; then, as the time for the final "rub" comes, employing a skilled "grind" to get them in form for the race, the examination. Our principal hospitals have everything that can be had, in the way of teaching. Hence, unless one is engaged in a special line of study, and has plenty of spare cash and leisure, let him first avail himself of the home opportunities, before he meditates a trip to Europe.

THOMAS H. MANLEY, M.D.

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

Although the profession may not be in entire accord as to the practical contagiousness of leprosy, there can be little question of the propriety of the action of the health authorities in isolating in a hospital tent on North Brothers Island the two Chinese lepers recently discovered in this city. What the final disposition of the patients may be is as yet somewhat uncertain, but it seems probable that they will eventually be returned to their native country. One of them is said to be possessed of ample means, and the United States Government may perhaps provide for the return of the other.

The action referred to was taken in accordance with the suggestions made in a special report upon the subject presented by Dr. Cyrus Edson, Chief of the Bureau of Contagious Disease. In this report Dr. Edson refers to the fact that numerous competent medical observers assert that under certain conditions leprosy is contagious. Among these he mentions Dr. R. Arnesen Hansen, the discoverer of the bacillus lepræ, Sir Morrell MacKenzie, Dr. Van Dyke Carter, Dr. N. C. Macnamara, and a number of American dermatologists. He then goes on to say: "The conditions favorable to the spread of leprosy are those existing in the so-called Chinese quarter in this city. Here we have a population consisting of people who are admitted by all authorities to be susceptible to the disease, among whom it is prevalent, and by whom many claim that it has been introduced into countries previously free from leprosy, as, for example, the Sandwich Islands and Australia. The habits of life as practiced by the Chinese in their so-called quarter are such as tend to favor the spread of any disease of a contagious nature. It is not necessary, in my opinion, to consider the anti-contagionist theory of leprosy. This theory is honestly maintained by such men as Danielson, of Norway, Nelson, of Canada, and others.

"Dr. C. M. Allen, in an introductory note to the well-known paper by Dr. MacKenzie, entitled, 'The Dreadful Revival of Leprosy,' very aptly says in regard to the opinion of the anti-contagionists, 'Honest opinion is always to be respected, but how many men of recognized ability in the profession who are fully cognizant of the history of the disease can believe it safe or wise to ad-

mit lepers into our country and harbor them here, where the chances of escaping the scourge are so great if proper precautions are taken, is beyond my comprehension.'

"Personally, I have given my opinion in regard to the contagion of leprosy in a recent paper. I believe leprosy to be contagious under certain conditions. These conditions, in my opinion, as I have before stated, exist in this city in the Chinese quarter. Between the honest differences of opinion that exist upon the subject of contagion, a large element of doubt, to say the least, is created. The benefit of this doubt should be given the people, to conserve public health. I therefore respectfully recommend that the two lepers in question be taken in charge by this department until they can be properly cared for by some other means. I also respectfully recommend that steps be taken at once to bring the matter of the care of leprosy before the United States authorities, to the end that a National lazaretto, where leprosy cases can be isolated, be established on the Atlantic coast."

In commenting on the disposal of these cases the President of the Board of Health, Mr. Wilson, remarked that the action of the Board was taken on consultation with the best physicians in the city, and that the members of the Board believed from the testimony submitted, that the isolation of the lepers was a necessary public measure. He also expressed the opinion that should a legal test be made, the courts would sustain this view.

The bodies sent to the city morgue do not often come to life, but this was the case in the instance of an apparently still-born infant brought there by its father a short time since. The child was a premature one, measuring but nine inches in length, and weighing but a pound and three-quarters, and as it showed no signs of life when born the ignorant midwife in attendance did not think it worth while to take any measures to resuscitate it, and told the father that the right thing to do with it was to take it to the morgue. Soon after the body of the infant had been laid upon the cold, hard slab it began to revive and uttered a feeble cry. The astonished keeper of the morgue snatched it up, and, wrapping a cloth about it rushed with it to Bellevue Hospital, near-by, where it was promptly treated with all possible care. Unfortunately, however, the little stranger was not long for this world, and a day or two afterward it died in earnest. Possibly, if the child had received proper treatment at the time of its birth—the exposure to which it was afterwards subjected thus having been avoided—it might perhaps have survived and eventually grown up to be a useful member of society. This is only one of the far too numerous cases of neglect and incompetence on the part of midwives that are continually occurring, and there can be no question that there is urgent need of reform in the matter of granting licenses to this class of persons. At present almost any woman, however ignorant, can apply for and obtain a certificate authorizing her to practice midwifery.

A Mrs. Charlotte Smith recently celebrated her hundred and first birthday at the residence of a daughter in Brooklyn, and in honor of the event she was waited upon by a large number of descendants, the youngest of whom

is a great-great-grandchild. The worthy old lady, who still retains her faculties in a remarkable degree, has now living six sons and daughters, thirty-four grandchildren, thirty-one great-grandchildren, and eighteen great-great-grand-children.

On the same day as Mrs. Smith, the newspapers report "Aunt Betsey Saunders," an inmate of the almshouse at Norwalk, Conn., was 101 years old, and the selectmen of the town, assisted by the inmates of the institution, properly celebrated the event. A substantial and more or less elaborate dinner was served, with the centenarian sitting in the place of honor at the head of the table.

While upon the subject of longevity it is worth while to mention that one day in August there was reported at the Bureau of Vital Statistics, the death of a negro, an inmate of the Colored Home of this city, at the remarkable age of 116 years. It is said that his wife, who died in November, 1888, at Astoria, just across the East River, where the old couple had lived in a small cabin for a very long time, attained the age of 110 years. P. B. P.

The Congress of American Physicians and Surgeons.

SECOND TRIENNIAL SESSION.

The Congress meets in Washington, D.C., September 22, to 25, inclusive. It is composed of the members of those National Medical Societies whose names and Secretaries are given below, and of foreign guests specially invited by the Executive Committee.

To enable a physician residing in the United States to become a member of the Congress, with the right to participate in its proceedings, it is necessary that he be a member of one of these Constituent National Societies.

A physician may be accredited as a visitor to the Congress by any one of the Constituent Societies. The certificate of the Secretary of one of these societies to the effect that he is thus accredited will enable him to register upon payment of the registration fee, which registration will entitle him to a card of admission to the President's reception and to a copy of the Transactions of the Congress, but not to take part in the deliberations of the Congress.

The following are the names of the Constituent Societies in the order of date of their organization, and the names and addresses of their respective Secretaries, to whom inquiries, as to mode of obtaining membership, should be addressed:

American Ophthalmological Society, Secretary, S. B. St. John, M.D., Hartford, Conn.

American Otological Society, Secretary, J. J. B. Vermyne, M.D., New Bedford, Mass.

American Neurological Association, Secretary, Graeme M. Hammond, M.D., 58 W. 46th Street, New York City.

American Gynecological Society, Secretary, H. C. Coe, M.D., 27 E. 64th Street, N. Y. City.

American Dermatological Association, Secretary, Geo. Thomas Jackson, M.D., 14 E. 31st Street, N. Y. City.

American Laryngological Association, Secretary, Chas. H. Knight, M.D., 20 W. 31st Street, New York City.

American Surgical Association, Secretary, J. R. Weist, M.D., 118 N. 8th Street, Richmond, Ind.

American Climatological Society, Secretary, J. B. Walker, M.D., 1617 Green Street, Philadelphia, Pa.

Association of American Physicians, Secretary, Henry Hun, M.D., 33 Elk Street, Albany, N. Y.

American Association of Andrology and Syphilology, Secretary, J. A. Fordyce, M.D., 66 Park Ave. N. Y. City.

American Orthopædic Association, Secretary, John Ridlon, M.D., 337 W. 57th Street, N. Y. City.

American Physiological Society, Secretary, H. Newell Martin, M.D., Baltimore, Md.

Association of American Anatomists, Secretary, D. S. Lamb, M.D., 800 10th Street, Washington, D. C.

American Pediatric Society, Secretary, W. D. Booker, M.D., 851 Park Ave., Baltimore, Md.

All physicians are invited to attend the meetings of the Congress and the public meetings of the Societies, but only those may register who are members, specially invited guests, or visitors accredited through the Secretaries of Constituent Societies.

The registration office will be in parlors 1 and 2 of the Arlington Hotel. From this office the mail of members and invited guests will be distributed, and here the city address of each member, guest, and accredited visitor can be ascertained. All members, invited guests and accredited visitors should register as soon as possible.

A registration fee of five dollars will be required of all members and accredited visitors. Invited foreign guests will register, but will pay no registration fee. A copy of the published Transactions of the Congress will be sent to all members, and to each invited guest and accredited visitor who is registered.

Only those who register, and the ladies accompanying them, will be admitted to the reception of the President of the Congress.

It is recommended that members effect registration in advance of the meeting by filling out the blank certificates of registration which will be sent to each member about September 10, and forwarding these certificates, with the requisite fee, to Dr. John S. Billings, Treasurer of the Congress.

The sessions of the Congress will be held from 3 to 6 P.M., daily, in the Main Hall of the Grand Army Buildings, 1412 and 1414 Pennsylvania Avenue.

The sessions of the Societies will be held according to the programs of each, as follows:

American Ophthalmological Society, Ladies Parlor, No 2, Arlington Hotel.

American Otological Society, Ladies Parlor, No 1, Arlington Hotel.

American Neurological Association, Parlors 182 and 183, Arlington Hotel.

American Gynecological Society, Lecture Hall, Columbian University, Cor. 15th and H Sts. N. W.

American Dermatological Association, Parlor, The Shoreham.

American Laryngological Association, Parlor A., Arlington Hotel.

American Surgical Association, Main Hall, Grand Army Building, 1412 and 1414 Pa. Ave.

American Climatological Association, Hall No. 2, Grand Army Building, 1412 and 1414 Pa. Ave.

Association of American Physicians, Hall No. 1, Grand Army Building, 1412 and 1414 Pa. Ave.

American Association of Andrology and Syphilology, The Shoreham.

American Orthopædic Association, New Reception Room, Arlington Hotel.

American Physiological Society, Parlor 181, Arlington Hotel.

Association of American Anatomists, Hall No. 3, Grand Army Building, 1412 and 1414 Pa. Ave.

American Pediatric Society, Parlor 206, Arlington Hotel.

The President of the Congress, Dr. S. Weir Mitchell, of Philadelphia, will deliver an address Wednesday evening, September 23, at 8 P.M., "On the History of Instrumental Precision in Medicine."

Members of the American Surgical Association and of the Association of American Physicians will conjointly entertain their foreign guests at a dinner at the Arlington Hotel, Thursday, September 24, at 8 P.M.

The American Gynecological Society will give a dinner at the Arlington Hotel, Thursday evening, September 24.

The American Orthopædic Association will give a dinner at the Hotel Arno, Thursday evening, September 24.

The American Laryngological Association will give a dinner at the Hotel Arno, Thursday, September 24, at 7 P.M.

The American Pediatric Society will give a dinner at the Arlington Hotel, Thursday evening, September 24.

The American Dermatological Association and the American Association of Andrology and Syphilology will, conjointly, give a dinner Tuesday evening, September 22.

The American Neurological Association will give a dinner at the Hotel Arno, Thursday evening, September 24.

The American Climatological Association will give a dinner, the time and place to be announced hereafter.

A number of distinguished physicians and surgeons from abroad have accepted the invitation to attend, among whom may be named Mr.

E. Brodhurst, Mr. Thomas Bryant, Mr. A. Durham, Mr. Reginald Harrison, Sir William MacCormac, Mr. Howard Marsh, Dr. William I. Ord, Mr. Frederick Treves, and Mr. U. Ritchard, of London; Mr. Robert Jones, of Liverpool; Dr. W. T. Gairdner, of Glasgow; Mr. E. H. Bennett and Professor J. J. Cunningham, of Dublin; Professor John Chiene and Dr. Battey Tuke, of Edinburgh; Mr. G. A. Wright, of Manchester; Dr. F. Beely and Professor H. Krause, of Berlin; Professor Cursch-

mann, of Leipzig; Professor Hoffa, of Wuerzburg; M. Emil Javal, Dr. Loewenberg, Dr. Pozzi, and M. Paul Redard, of Paris; Dr. Von Mozengeil, of Bonn; and Dr. Rafael Lavista, of Mexico.

As other societies will meet in this city during the Congress week, it will be prudent for members and visitors to secure hotel accommodations in advance. The Arlington offers accommodations at the rate of four dollars per day, and the Hotel Arno at three and four dollars a day on the American plan, or one dollar a day per room only, on the European plan.

The Committee will take pleasure in answering any inquiry relating to the local arrangements of the Congress.

OFFICERS OF THE CONGRESS.

President, S. Weir Mitchell, M.D.

Vice-Presidents, ex-officio Presidents of Constituent Societies.

Chairman of Executive Committee, William Pepper, M. D., Philadelphia, Pa.

Treasurer, John S. Billings, M.D., Washington, D. C.

Secretary, William H. Carmalt, M.D., New Haven, Conn.

COMMITTEE OF ARRANGEMENTS.

Samuel C. Busey, M.D., Chairman, 1545 I Street N. W., Washington, D. C.

John S. Billings, M.D., Army Medical Museum, Washington, D. C.

W. W. Johnston, M.D., 1603 K St., Washington, D. C.

R. T. Edes, M.D., 1214 18th St., Washington, D. C.

S. O. Richey, M.D., 732 17th St., Washington, D. C.

J. Taber Johnson, M.D., 1728 K St., Washington, D. C.

Sam'l S. Adams, M.D., 1632 K St., Washington, D. C.

I. E. Atkinson, M.D., 605 Cathedral St., Baltimore, Md.

C. F. Bevan, M.D., 807 Cathedral St., Baltimore, Md.

Samuel Johnson, M.D., 204 Monument St., Baltimore, Md.

Samuel Theobald, M.D., 304 Monument St., Baltimore, Md.

H. Newell Martin, M.D., Johns Hopkins Hospital, Baltimore, Md.

D. Forest Willard, M.D., 1818 Chestnut St., Philadelphia.

D. S. Lamb, M.D., 800 10th St., Washington, D. C.

The University Marine Biological Association.

This association was founded for the purpose of establishing and maintaining laboratories and aquaria on the coast of the United States, where accurate researches may be carried on, leading to the improvement of the biological sciences and especially to an increase of our knowledge as regards the food, life-conditions and habits of American food-fishes and mollusks, and for stimulating public interest in these matters. The location of the first laboratory is at Sea Isle City, N. J. The importance of possessing seaside laboratories at which the working naturalists of the country, the teachers in schools and colleges, the patient investigators in pure science, the gov-

ernment experts, and others, could secure a practical acquaintance with the structure and habits of marine animals, has long been appreciated in Europe. It is proposed to issue, at irregular intervals, monographs which shall deal with the structure and life-history of the types of life in this region, written in a style which shall be clear to the uninitiated reader while retaining strict scientific accuracy. These monographs are to be well illustrated, and a special publication fund should be secured at as early a date as possible. To-day our Government and State fish hatcheries are the patterns for the world, and our agricultural experimental stations are proving of untold benefit to those who till the soil or raise domestic animals. But in one direction we are still sadly behind the times. Until very recently America has had no well-established laboratories offering facilities for the study of the lower forms of marine life, and her naturalists have been obliged to accept the courtesy of foreigners for their opportunities of gaining an acquaintance with those smaller forms which are either valuable in themselves, or serve as sources of food supply for valuable fishes, etc.

An annual report, summing up the result of the season's work and calling attention to the achievements and needs of the Laboratory, will be published, to be distributed among the legislators of New Jersey and other States, to the members of the University Marine Biological Association, and to the general public, that they may become aware of the importance of giving encouragement to laboratories of this character.

The number of naturalists who can be employed in special investigation, and definitely retained for the purpose of carrying on their researches throughout the year, must depend on the funds subscribed by private individuals and public bodies for the purpose. The first charges on the revenue of the Association are the workings of the sea-water circulation in the tanks, stocking the tanks with marine plants and animals and feeding the latter, the payment of servants and fishermen, the hire and maintenance of fishing boats, and the salary of the Director, the Scientific Staff and Laboratory Corps. These are the only salaried officers of the Association.

The Marine Biological Association urgently needs additional contributions for the establishment of a sinking fund and for the purchase and maintenance of a sea-going vessel, by means of which investigations can be extended to all such points of the coast as may be of interest in regard to their food products (fish, oysters, clams, lobsters, etc.), to keep the Laboratory open throughout the entire year: to increase the permanent staff engaged at Sea Isle City, and to secure and maintain a library of the necessary books of reference.

The purpose of the University Marine Biologi-

cal Association, like the Association founded a few years since in England ("The Marine Biological Association of the United Kingdom"), is to aid at the same time both science and industry. It is national in character and constitution, and its affairs are watched over by the Trustees of the University of Pennsylvania without any charge upon its funds, so that the whole of the subscriptions and donations received are devoted absolutely to the support of the Laboratory and the prosecution of its work.

WHAT SHALL BE DONE FOR A PATIENT WITH A FOREIGN BODY IN ONE OF THE BRONCHI.—

Dr. J. D. Rushmore says the age, condition of the patient and state of the respiratory organs, as well as the size, shape, weight, etc., of the foreign body should be taken into account before advice is given. A foreign body in a bronchus is always a menace to life, as it causes ulceration, hæmorrhage, abscess, pneumonia, broncho-pneumonia, pulmonary thrombosis, etc., in proportion to the firmness with which it is held, and should it become loose, asphyxia, œdema or both may occur. Other methods than those used up to the present time are justifiable when we consider that the failure to extract foreign bodies from the bronchus is 78.38 per cent. The cause of anxiety in the operation through the anterior wall of the chest is the possibility of wounding the pulmonary vein. The posterior or Nesiloff operation is less difficult and much less dangerous. It consists in opening the thoracic cavity into the posterior mediastinum from behind, by the resection of four ribs, without touching the pleura. The posture of the patient is on the abdomen, the arm abducted and raised. A vertical incision is made parallel to the vertebral column, and at a hand's breadth to the left, through the whole thickness of the parts; two horizontal incisions are carried toward the vertebræ, running from the extremities of the vertical incision; a flap is dissected back and a subperiosteal resection of the third, fourth, fifth and sixth ribs is done separately. The pleura is easily pushed forward and the bronchus found. A preliminary opening below or into the pharynx should be made before resorting to inversion, striking the chest, etc., to dislodge a foreign body, thus preventing the danger from asphyxia should it remain in the larynx. Experience in the management of such cases support the following conclusions: 1. A foreign body in a bronchus is always a source of danger to the patient and its spontaneous expulsion is very exceptional and may be long delayed, thus causing inflammation and its results, which is more frequent than asphyxia. 2. The dangers of operative interference should not prevent an attempt at the earliest possible removal, which should be preceded

a preliminary opening into the larynx or trachea. 3. After a reasonable search through the trachea and bronchus, opening the thoracic cavity in front of the mediastinum or pleural cavity posteriorly is justifiable; all operative measures being done at a single operation if possible.—*N. Y. Medical Journal*, July 25, 1891.

New Method of Direct Electrization of the Stomach.

Electricity has for a long time held so important a place in the treatment of visceral diseases that it is surprising that so little has been accomplished in perfecting a method for its application to the stomach, one of the most readily reached of all internal organs. In 1877, Kussaul began to practice direct electrization of the stomach by means of an olive-shaped electrode introduced upon the extremity of an insulating stomach-tube, but the apparatus was clumsy, and, because of its direct contact with the visceral wall, forbade the use of a galvanic current. Bardet's improved electrode (1884) was a distinct advance, but was inconvenient and even impracticable for all but patients well accustomed to lavage of the stomach.

FEINHORN (*Medical Record*, May 9, 1891), has constructed an electrode on the principle of his "Stomach bucket," and proposes for it the name "Deglutable Stomach Electrode." It consists of a hard-rubber capsule (about one and one quarter inches in length) perforated with numerous openings, this cage serving to protect the metal knob within from direct contact. The connecting wire runs through a fine flexible rubber tube. The capsule is readily swallowed and tolerated by the patient, and contact is secured, as in Bardet's electrode, by water in the stomach. The faradic current has been generally employed, and in all cases the degree of acidity of the stomach has been markedly increased. The author makes a preliminary report, which goes to show that most decided results have been obtained in cases of dilatation and in grave cases of chronic gastric catarrh. Two cases of pure neuralgia showed an amelioration after use of the constant current. The majority of cases of hyperacidity were improved, but required the administration of alkalies in the usual way.

NEW METHOD OF DRESSING THE CHEST IN PNEUMONIA AND PLEURISY.—The following method is recommended by Dr. William Hunt: A very thin layer of cotton is applied over the affected side, from spinal column to sternum, and secured with collodion smeared thoroughly over by means of a broad brush, like a mucilage brush. Then add thicker layers, securing them with collodion, until a good padding is

obtained, paying particular attention to the edges. In double cases the dressing may encircle the chest. The advantages are: 1. The one dressing, if well applied, will last throughout the case; and hence, 2, the fatigue and discomfort of frequent poulticing are avoided. 3. The side, in unilateral cases, is held as in a splint, while the free side does the breathing. A first-class non-conductor is covering the chest. The contracting collodion may have some influence in controlling the blood supply. 4. There is no particular interference with physical examination, to one who has a good ear. Maybe it would be a good thing if there was; for, having once made the diagnosis, what is the use of exhausting the patient every day by trying to find out whether $\frac{1}{8}$ of an inch, more or less, is involved? The general symptoms will tell that.—*Annals of Gynecology and Pediatrics*.

A WRITER in the *British Journal of Dermatology* relates that, after using his thumb-nail to remove softened warts, three warts developed on his thumb, confirming him in a view which he had entertained on other evidence, that the popular belief in the contagiousness of warts is well founded.

BOOK REVIEWS.

TWELVE LECTURES ON THE STRUCTURE OF THE CENTRAL NERVOUS SYSTEM, FOR PHYSICIANS AND STUDENTS. BY DR. LUDWIG EDINGER, Frankfort-on-the-Main. Second Revised Edition, with 133 Illustrations. Translated by Willis Hall Vittum, M.D., St. Paul, Minn. Edited by C. Eugene Riggs, A.M., M.D., Professor of Mental and Nervous Diseases, University of Minnesota; Member of the American Neurological Association. Philadelphia and London: F. A. Davis. 1890.

The present volume of 225 octavo pages contains a series of twelve lectures delivered by Dr. Edinger, of Frankfort-on-the-Main, upon the minute structure of the brain. In the translation of a second edition, under date of 1890, the author pays a special tribute to the labors of American physicians, and very courteously recognizes the valuable services which Dr. Vittum as Translator, and Dr. Riggs as Editor, have rendered in thus enabling him to bring this work into relation, as he says, with English-speaking physicians.

In these twelve lectures the method of studying nervous structures, the embryology and comparative anatomy of the brain in general, as also its regional anatomy and its varied relations, are carefully described and amply illustrated.

Those who desire to attain to the latest discoveries in the minute anatomy of the brain, medulla and spinal cord, will find in this work, in compact form, a reliable statement of the most recent investigations upon the subject.

Dr. Edinger has published annually since 1886, in Schmidt's Jahrbücher, a statement of the yearly advances made in the study of cerebral anatomy. Those who wish to keep fully abreast of his teachings will do well to consult these annual reviews.

TEXT-BOOK OF MEDICAL JURISPRUDENCE AND TOXICOLOGY. By JOHN J. REESE, M.D., Professor of Medical Jurisprudence and Toxicology in the University of Pennsylvania; Late President of the Medical Jurisprudence Society of Philadelphia, Honorary Member of the New York Academy of Anthropology, Corresponding Member of the New York Medico-Legal Society, etc. Third Edition, Revised and Enlarged. Philadelphia: P. Blakiston, Son & Co., 1012 Walnut St. 1891.

It may safely be said, that in no department of medical teaching in the United States has there been such shortcoming, as in that of medical jurisprudence and toxicology. The result has been that physicians have not infrequently brought discredit to themselves and to their profession by signal and conspicuous failures, when called to occupy the witness' stand. Not that elaborate works were wanting upon these subjects—for the abilities of such writers as Beck, Taylor, Caspar Wharton Stillé and others are everywhere recognized—but their elaborate works demanded more time for careful study than students were able to command, while, in large measure, our medical colleges have failed to emphasize the necessity of a most thorough acquaintance with these subjects. The result has been that, in a very great majority of instances, after graduation physicians have failed to perfect themselves in these fields of study, and oftentimes their deficiencies have been disclosed to the public in open court, in a manner much to their discredit.

In the present volume the essentials of the science of legal medicine are tersely and clearly set forth in a single volume of 650 pages. The rules to be observed by experts, the phenomena and signs of death, post-mortem appearances, the identification of the dead, the nature and extent of wounds, and causes of death, are among prominent topics considered in the first 200 pages.

The subject of toxicology holds a prominent place in the work. The various poisons and their antidotes are carefully considered. The toxic influence of ptomaines is the subject of a newly written and interesting chapter. Feigned diseases, criminal abortion, infanticide, legitimacy, impotence, rape, insanity, malpractice, liabilities of druggists, and kindred topics, com-

plete the volume. It will be found admirably adapted to class work, as that form of teaching is becoming more and more prominent in our medical schools.

The fact that a third edition has been so soon in demand, is evidence of the need of such a work on the part both of students and practitioners, and its very extended sale is also evidence of the satisfactory manner in which the work is meeting that need.

THE POCKET ANATOMIST. Founded upon Gray. By C. HENRI LEONARD, A.M., M.D., Professor of the Medical and Surgical Diseases of Women and Clinical Gynecology, in the Detroit College of Medicine. Fourteenth revised edition, containing Dissection Hints and Visceral Anatomy. Detroit: The *Illustrated Medical Journal* Co., Publishers. 1891. Cloth, 297 pages, 193 Illustrations. Price, postpaid, \$1.

An excellent little book, which the title fully describes. It is well illustrated by plates reduced from Gray.

A DICTIONARY OF PRACTICAL MEDICINE, by Various Authors. Edited by James Kingston Fowler, M.A., M.D., Fellow of the Royal College of Physicians; Senior Assistant Physician to the Middlesex Hospital, and Lecturer on Pathological Anatomy in the Medical School; Senior Assistant Physician to the Hospital for Consumption and Diseases of the Chest, Brompton. Philadelphia: P. Blakiston, Son & Co., 1012 Walnut Street. 1890.

This is a concise and valuable octavo volume of over nine hundred pages, representing the views of some forty different English writers with reference to the nature and treatment of the various diseases which are by them severally considered, the unsigned articles being in the main written by the Editor and by Mr. John Abercrombie. The wide range of subjects referred to renders it really a condensed cyclopædia of the practice of medicine. A careful examination of a large number of the diseases described and the methods of treatment advised, renders it evident that the work will prove one of special value to practicing physicians, especially for purposes of ready reference.

The details of treatment are so fully given, that one may at the moment come upon the views of the writer, and in the main the suggestions are eminently practical and judicious. The subjects are arranged in alphabetical order, rendering it, as its title indicates, a very complete dictionary of practical medicine. It includes, beside the diseases usually considered in works of practical medicine, those also peculiar to women. The younger members of the profession especially will find it to their advantage to obtain this work, and carefully consult its teachings.

NECROLOGY.

Abraham Coles, M.D., LL.D.

The sudden death of Dr. Abraham Coles, of Newark, N. J., in June last, at the Hotel Dieponte, near Monterey, Cal., was a loss not only to the medical profession, but to the community in which he had lived for so many years, and to the world of literature which he had graced by numerous classical and poetical contributions. Dr. Coles and his son, Dr. J. A. Coles, were members of the Pennsylvania Railroad excursion party that left Newark on April 14, for a visit of several weeks to the Pacific Coast, during the latter part of which he suffered from a severe attack of grippe. His death was due to some complication arising from it. Dr. Coles was born at Scotch Plains, N. J., December 26, 1813. His father was a well-known printer and publisher of his day, and a man of rare literary taste and judgment. Dr. Abraham Coles, in the earlier years of his life, devoted himself to literary pursuits. At the age of 17 he was teacher of Latin and mathematics in a private school at Plainfield. Here he turned his attention more particularly to the law, but gave up the study to enter Jefferson Medical College, graduating in 1835. In 1836 he settled in Newark, where he soon established an extensive and lucrative practice, and made for himself a wide reputation as a skilful physician and surgeon. In 1842, he married Caroline E., daughter of Jonathan C. Ackerman, of New Brunswick. Five years later Mrs. Coles died, leaving one son, now Dr. John A. Coles, and one daughter. Dr. Coles visited Europe, and was in Paris at the time of the revolution of 1848, and did excellent service as surgeon in the French hospitals. He paid a second visit to Europe in 1854. In 1860 the University at Lewisburg conferred upon him the degree of Ph.D., and in 1871 Princeton College that of LL.D.

Dr. Coles' literary work was voluminous and judicious. His love for the classics and his bent of mind led him to Greek, Latin and Oriental literature as a student and explorer. His metrical versions of the Psalms were original translations as well as versified transcriptions. He translated and printed, in 1847, his own version of the famous Latin hymn, "Dies Iræ," and in 1859 republished this in another volume with twelve other versions by other hands. In 1866, he printed "The Microcosm," a physiological poem, originally delivered before the New Jersey Medical Society, of which he was then President. In 1847 he had published the first part of "The Gospel," which was the Life of our Lord in verse, with texts and notes, and in 1881 he put forth a volume which, under the title of "The Microcosm and Other Poems," included all of

his more important translations and original poems. His "Latin Hymns" appeared in 1868; his "Light of the World" in 1884; his versified edition of the Psalms of David in 1889.

Karl Marx, M.D.

Dr. Karl Marx, a Moravian missionary of note, whose home for five years has been some 11,300 feet above sea level in the mountains of Western Thibet, died May 29, from an attack of influenza and pneumonia. His station was at the little mountain village called Leh, in the province of Ladak, on the highroad to Chinese Thibet, the only remaining hermit nation of Central Asia. Consumption is said to be unknown at Leh, and it has been one of the complaints of Dr. Marx that the people there were generally so strong and well, that they gave him very little to do. In a recent number of the *London Practitioner*, Dr. Marx expressed the opinion that the infectious diseases, when introduced into the Thibet Highlands, where he dwelt, became modified and mitigated. For example, he mentioned that small-pox is said to be converted into a disease resembling varicella, and rabies, though frequent and fatal among the canine species, does not beget hydrophobia in the human subject, as it does in the more southerly valleys of Lahore. He thought that when his lofty region should become less difficult of access, there could be established there a sanitarium for all sorts and conditions of human diseases. All the members of the missionary outpost at Leh were taken ill with the influenza, and they suffered severely, but only one adult was carried off by it.

DR. THOMAS L. SMITH, a retired Medical Director of the Navy, died August 14, at Brooklyn. He was born at Orange, N. J., ninety-one years ago. He entered the public service in 1828, as surgeon's mate, and was retired about twenty years ago.

DR. GEORGE H. LYMAN, formerly physician to the Boston City Hospital, died in London, England, August 19, at the age of seventy-two years. He had been member of council in the American Gynecological Society, and author of an exhaustive essay on the history and statistics of ovariectomy. During the late war, he held important positions, becoming medical inspector in the Army, with the rank of lieutenant-colonel.

DR. JOHN JEFFERSON DEMENT, an ex-president of the Alabama Medical Association, died August 10, at Lithia Springs, Georgia. He was prominent in all the educational and medical institutions in Huntsville, where his home was, and in its vicinity. He was also trustee of Van-

derbilt University, Nashville, Tenn. He served as surgeon with Lee's army during the whole of the late war, except during a period of imprisonment at Camp Chase, which lasted about four months. His death took place, when he was in his sixty-second year, from renal disease.

MISCELLANY.

DR. H. F. EWERS has removed from Union City, Mich., to Burlington, Ia.

AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.—The first annual meeting of the American Electro-therapeutic Association, will be held at Philadelphia, Pa., September 24th, 25th, and 26th, 1891, in the hall of the College of Physicians, cor. 13th and Locust sts.

First Day, Thursday, September 24, 3 p.m.

1. President's Address, by Dr. G. Betton Massey, Philadelphia.
2. Electro-Therapeutics in America; An Historical Survey, by Dr. A. D. Rockwell, New York.
3. The Action and Application of the Faradic Current in Gynecology, by Dr. Augustin H. Goelet, New York.
4. Alternative Currents, Dr. Horatio R. Bigelow, Philadelphia.
5. The Treatment of Corneal Opacities by Galvanism, by Dr. C. A. W. Alleman, Brooklyn, N. Y.

Second Day, Friday, September 25, 10 A.M.

6. Report of Seventy-five Cases of Uterine Myomata Treated by Electricity, by Dr. J. H. Kellogg, Battle Creek, Mich.
7. Two Cases of Fibroids where Electricity Ceased to control Hæmorrhage after a time, although eminently satisfactory at first, by Dr. H. E. Hayd, Buffalo, N. Y.
8. The Treatment of Fibroids by Electricity, by Dr. W. H. Hutchinson, Providence, R. I.
9. Electro-Puncture in Uterine Fibroids, by Dr. G. Betton Massey, Philadelphia.
10. Electricity in Chronic Parametritis, by Dr. Von Raitz, New York.
11. Report of a Case, by Dr. A. H. Buckmaster, Brooklyn.
12. Some New Applications of Electro-Therapeutics, by Dr. Frederick Peterson, New York.
13. The Analgesic Effects of Galvanism, by Dr. Landon Carter Gray, New York.
14. Electricity in Diseases of the Stomach, with Exhibition of Patient, by Dr. Lawrence Wolff, Philadelphia.
15. Electricity in Carcinoma, by Dr. Robert Newman, New York.
16. Title not Received, Dr. W. J. Morton, New York.
17. Title not Received, Dr. Henry McClure, Cromer, England.
18. Some Points in the Technique of Electrolytic Epilation, by Dr. Plym S. Hayes, Chicago, Ill.
- 8.30 P. M., Business meeting.

Third Day, Saturday, September 26, 10 A. M.

19. A Rare Case of Twin Extra—and Intra—Uterine Pregnancy Treated by Electricity, by Dr. G. H. Whitcomb, Greenwich, N. Y.
20. Electricity in the Treatment of Rheumatism, by Dr. W. F. Robinson, Albany, N. Y.
21. The Treatment of Subacute Articular Rheumatism by Electricity, by Dr. M. A. Cleaves, New York.
22. Electricity in Anchylosis, by Dr. Von Raitz, New York.

23. Has Electricity any Action as a Germicide, or in Producing Poisonous Results in Food, by Dr. W. R. D. Blackwood, Philadelphia.

24. Exhibition of a Rectal Electrode, with Remarks on its Application, by Dr. Guy Hinsdale, Philadelphia.

25. Abdominal Electro-Puncture in an Ovarian Tumor by Dr. G. Betton Massey, Philadelphia.

26. Eight Months' Work in the Dispensary for the Treatment of the Diseases of Women, by Electricity, by Dr. H. R. Bigelow, Philadelphia.

CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS SECOND TRIENNIAL SESSION.—The Trunk Lines, the New York and Boston Lines, the Southern Passenger Association, and the Central Traffic Association, will transport persons wishing to attend the Congress from points on their lines to Washington and return at the price of one and one-third the regular fare on the following conditions:

The going ticket must be purchased within three days before the opening date of the meeting.

Each person availing himself of the concession must pay full first-class fare going to the meeting, and must obtain a certificate from the agent of whom the ticket is purchased.

Those holding such certificates, when countersigned by the proper officer at the Congress, can obtain return tickets at one-third the highest limited fare.

Certificates are not transferable, and the return ticket secured upon certificates are not transferable. If any of them are sold or transferred they must be redeemed at the highest first-class rate by the person making such sale or transfer.

No certificates will be countersigned at the Congress except those presented by physicians attending the Congress, or their wives and members of their families; no will any certificate be countersigned after September 26.

No refund of fare will be made on account of a person failing to obtain a certificate.

Those who wish to avail themselves of this method of obtaining reduction in fares, should present themselves at the office for certificates and tickets at least 30 minutes before departure of trains.

It is absolutely necessary for each passenger before starting to obtain a certificate from the ticket agent of whom the going ticket is purchased, otherwise he can obtain no reduction in the return fare.

There will be no stop-over privileges on the return tickets, which must always be by the same route as the going ticket.

Members may obtain tickets on these conditions for their wives and members of their families, as well as themselves.

Tickets for the return journey will be furnished only provided the *properly countersigned certificates* are presented to agent at return starting point within three days after the adjournment of the Congress, Sunday to be counted as a day.

By order of the Committee of Arrangements.

SAMUEL S. ADAMS, M.D.,

in charge of R. R. matters.

1632 K Street, Washington, D. C., August 18, 1891.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from August 22, 1890, to August 28, 1891.

Capt. James E. Pilcher, Asst. Surgeon U. S. A., is relieved from duty at Ft. Clark, Tex., on expiration of leave of absence, and is assigned to duty at Ft. Ringgold, Tex.

Capt. M. C. Wyeth, Asst. Surgeon U. S. A., sick leave of absence extended three months on surgeon's certificate of disability. Major Valery Havard, Surgeon U. S. A., granted three months leave of absence, to take effect on or about September 5, 1891.

Official List of Changes in the Medical Corps of the U. S. Navy, the Week Ending August 29, 1891.

P. A. Surgeon F. A. Hesler, detached from U. S. S. "Pensacola" and to the U. S. S. "Charleston."

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No. 11.

ORIGINAL ARTICLES.

ORIGINAL INVESTIGATIONS ON THE HEATING AND VENTILATION OF SCHOOL BUILDINGS.

Read in the Section of State Medicine, at the Forty-second Annual Meeting of the American Medical Association, at Washington, D. C., May, 1891.

BY R. HARVEY REED, M.D. (UNIV. OF PENN.),
OF MANSFIELD, O.

Member Committee of School Hygiene of the Section of State Medicine, American Medical Association; Member American Public Health Association; British Medical Association; National Association of Railroad Surgeons; Ohio State Medical Society; President North Central Ohio Medical Society; Health Officer, Mansfield, O.; Surgeon Baltimore and Ohio R. R.; Honorary Member D. Hayes Agnew Surgical Society, Phila.; Texas State Medical and State Sanitary Association, etc.

At the meeting of the American Medical Association, held at Newport, R. I., two years ago, a special committee was appointed by the Section of State Medicine on "school hygiene," consisting of Dr. D. F. Lincoln, Geneva, N. Y.; Dr. J. A. Schenck, Topeka, Kan.; Dr. Geo. H. Rohé, Baltimore, Md.; Dr. J. G. Pinkham, Lynn, Mass.; and the author.

After some correspondence, it was decided to divide the work of this committee, and as a result, I was assigned the "original investigations on the heating and ventilation of school buildings."

After no small amount of research among the multiplicity of reports of the numerous air analyses of the different school-rooms in the various cities, I found them all practically valueless, so far as making anything like a systematic comparison of results was concerned, of even an approximately scientific character.

By this I mean to say that they all lacked the details regarding those numerous modifying elements, which of necessity surround each individual room; such as the temperature *outside* of the school building; the temperature *inside* of the same at the level of the floor, mouth and ceiling, both in the front and at the rear of the room, the same observations regarding the humidity, as well as that of the carbon dioxide; the number of scholars present; the size of the room; the method of heating the same, as well as the system of ventilation employed; the amount of fresh air supplied, and the quantity of foul air discharged from a room, in a given time, together

with the barometric pressure—each one of which is an important arc of a complete circle; and of necessity must all be considered together, and due credit given each one, in order to obtain anything like definite or reliable information regarding any special method or system of heating and ventilating a given room or a certain building.

With a view of obtaining the most reliable results possible, I devised a blank chart, which I thought would, as near as possible, contain all these more important factors.

I then determined to pursue the same line of investigation, of different school-rooms in the same building; and different buildings in the same city; and different cities in the same State; among which I designed to embrace as large a variety of the various methods of heating and ventilation, as we practically could, and to repeat our examinations sufficiently often on the same systems, when at all practical, to enable us to arrive at some definite conclusions, regarding any special method of heating and ventilation, if such were at all possible.

As a result, I prepared a chart which embraces the following details:

- 1st.—Date and time of day inspection was made.
- 2nd.—Name of school building.
- 3rd.—Name of school-room.
- 4th.—Number of pupils present.
- 5th.—Number of cubic feet of air contained in the room.
- 6th.—Temperature outside of the building.
- 7th.—Humidity outside of the building.
- 8th.—Barometric pressure in inches.
- 9th.—State or condition of the weather.
- 10th.—Kind of heating apparatus in use.
- 11th.—System of ventilation employed.
- 12th.—Number of cubic feet of fresh air supplied per hour.
- 13th.—Number of cubic feet of foul air discharged per hour.
- 14th.—Temperature at the front of the room. *a*, at the floor; *b*, at the mouth; *c*, at the ceiling.
- 15th.—Temperature at the rear of the room. *a*, at the floor; *b*, at the mouth; *c*, at the ceiling.
- 16th.—Humidity at the front of the room. *a*, at the floor; *b*, at the mouth; *c*, at the ceiling.
- 17th.—Humidity at the rear of the room. *a*, at the floor; *b*, at the mouth; *c*, at the ceiling.

18th.—The amount of carbon dioxide found in the air of the city per 10,000 parts.

19th.—The amount of carbon dioxide per 10,000 parts found in the air in the front of the room. *a*, at the floor; *b*, at the mouth; *c*, at the ceiling.

20th.—The amount of carbon dioxide per 10,000 parts found in the air at the rear of the room. *a*, at the floor; *b*, at the mouth; *c*, at the ceiling.

BACTERIOLOGICAL INVESTIGATION.

21st.—Germs found in the air of school rooms when occupied. *a*, near the floor at the point of entrance of the fresh air; *b*, near the floor at point of exit of foul air.

22nd.—Miscellaneous observations.

Having completed the general plan of investigations, I then determined to investigate, as far as practicable, the following methods of heating and ventilating school rooms.

1st.—School rooms warmed by common stoves, with and without any provisions for ventilation, other than windows, doors and transoms.

2nd.—School rooms warmed by small furnaces placed in each room, which heated fresh air received from the outside, and delivered it to the room, with and without provisions for the escape of the foul air, other than that furnished by the doors, windows and transoms.

3rd.—School rooms warmed by furnaces or heaters, and ventilated at the top.

4th.—School rooms warmed by furnaces or heaters, and ventilated at the floor.

5th.—School rooms warmed by furnaces or heaters, and ventilated at the floor and ceiling both.

6th.—School rooms warmed by direct steam and ventilated by doors, transoms and windows.

7th.—School rooms warmed by indirect steam and only ventilated by foul air ducts, windows and transoms.

8th.—School rooms warmed by both direct and indirect steam and ventilated by foul air shafts, windows and transoms.

9th.—A school room warmed by direct steam, and ventilated by an open fire place and a top ventilator.

10th.—School rooms warmed by a furnace which delivers the hot air to the room at the floor, and which room is also supplied with cold fresh air at the floor, and is provided with means for removal of foul air at the top of the room.

11th.—School rooms warmed by an air warmer, which supplies the warm air at the floor, and removes the foul air at the floor without the aid of open doors, windows or transoms.

After having completed the outline of these proposed investigations, I next found it quite a difficult task to secure the services of a competent chemist, who was willing and able to undertake the work I had laid out. But after corresponding with the chemists of several cities, I obtained the services of Prof. Lewis Schmidt, B.

Sc. (Mass. Institute of Technology), of Cincinnati, Ohio, to undertake the chemical investigations, together with the humidity, temperature, etc., etc.; which he conducted throughout the entire investigation for me, in a perfectly satisfactory manner.

The original report contemplated the examinations for carbon monoxide (CO) but as this product is seldom found in the air, except when it has been passed for a considerable period, of at least two hours, over red hot iron plates, we decided to omit this part of the report, and also the examination for organic matter, owing to the impractical character of the former, and the unreliable methods of determining with any degree of scientific accuracy the latter.

Arrangements were supposed to have been made with a couple of bacteriologists to complete the bacteriological part of the work in a systematic manner. But when their work was received, it was found to have been conducted in such a *helter-skelter* manner, as to render it utterly valueless for this report, and in consequence I was compelled to omit it entirely. In fact I don't think it has detracted anything from the practical value of the report at best; my experience in this direction, has led me to conclude that there is little to be derived from this particular field, of a practical character, that will effect either the heating or ventilation of school rooms, either pro or con. Yet if properly conducted in a *systematic* manner, it might be made to serve the purpose of proving whether the germs are increased or diminished in quantity, from the time the air enters the room until it leaves it, and approximately to what extent, and under what circumstances. Outside of this I cannot conceive of any particular value to be derived from it; and certainly not when made without any apparent reference to a definite object, as was done in this case.

I next selected Cleveland, Mansfield, Columbus and Cincinnati, Ohio, for the cities in which I would conduct the proposed investigations; and to which I gave my personal attention, in Mansfield and Cleveland, and in part my personal attention in Columbus and Cincinnati, but least so in the latter, having only visited a few of the school rooms in that city, owing to unavoidable circumstances, which prevented my presence during the investigations there.

My instructions were to make investigations of each room, as near as possible under the conditions it was usually kept in, and to be very careful to leave nothing undone that would enable us to obtain the highest degree of accuracy possible, regardless of the system of heating and ventilation we were investigating, as we were seeking actual facts, for scientific purposes, let them reveal what they would.

In carrying out these investigations, we have

made altogether 224 determinations of the carbon dioxide, not including the examinations of the outside air; 233 determinations of the humidity, not including those made outside of the buildings; and 232 examinations of the temperature exclusive of those made outside of the buildings; leaving nothing of the numerous other auxiliary observations of surrounding conditions.

These examinations were made in 39 different school rooms, of 23 different school buildings, in different cities, and include 10 different systems of heating and ventilation.

By referring to the itemized charts, you will observe that we have examined the air in 10 rooms in Mansfield, 7 rooms in Cleveland, 4 rooms in Columbus, and 18 rooms in Cincinnati: which embraced 11 rooms heated by the so-called Grossius system; 11 rooms warmed by the head system; 5 by the Johnson system; 3 by direct steam; 3 by common stoves; 2 by direct steam; 1 each by the Patric and Miller furnaces; direct steam with an open grate, and direct and indirect steam. You will also observe that we have made 6 examinations each, of the temperature, humidity and carbonic dioxide in each room, viz.: two each at the floor, one each in the front and rear of the room; two at the mouth, one each in the front and rear of the room; and one at the ceiling, one each at the front and rear of the room; besides all the supplementary investigations we have associated with these three primary determinations.

In making these investigations we used tested thermometers for obtaining the temperature; whilst a carefully constructed hygrometer was used for determining the amount of moisture contained in the air, the scale of which was so constructed as to represent complete saturation at 100 and complete dryness at 0. For determining the velocity of the currents of air, we used a delicately constructed anemometer, which would register the velocity of any current of air, that was moving over 30 feet a minute. By means of glass rods, rubber hose and a small bellows, we could obtain air from any desired part of the room, a given quantity of which was pumped into clean dry bottles, of a known capacity, which were carefully corked and labeled, and taken to the laboratory for the determinations of the CO₂, which was obtained by neutralizing the carbon dioxide with a barium solution of a known quantity and strength, and calculating the amount of CO₂ per 10,000 parts of air from that, in the usual manner, which is familiar to all practical chemists.

By referring to these itemized charts, one of which has been prepared for each city, in which examinations of the air was made, you will observe that with the exception of the Smead system, either doors, windows and transoms, or all, were relied on for ventilating and regulating the temperature of the room.

From these *itemized charts* we have compiled a number of tables which embrace:

1. The highest and lowest temperature, and the highest and lowest humidity, outside of the building examined, and also the average temperature and humidity of the air of the city, which we have shown: *a*, as found in each city; *b*, as found associated with each system of heating and ventilation; *c*, the general average of each.

TABLE I,
Showing the highest and lowest temperature and the highest and lowest humidity outside of the buildings, together with the average of the same, by cities.

LOCATION.		Temperature outside of the Building, Fah.	Humidity outside of the Building, based on 100 for complete saturation.	Total number of examinations made.
Mansfield, Ohio.	Highest . .	38.0	89.8	10
	Lowest . .	27.5	46.3	
	Average . .	32.0	71.1	
Cleveland, Ohio.	Highest . .	55.2	89.5	7
	Lowest . .	33.0	35.4	
	Average . .	45.3	49.0	
Columbus, Ohio	Highest . .	53.0	59.4	4
	Lowest . .	44.5	42.3	
	Average . .	49.5	50.8	
Cincinnati, Ohio	Highest . .	69.0	100.0	18
	Lowest . .	33.5	48.0	
	Average . .	52.0	75.3	
Grand average for the four cities above named out of 39 examinations	Highest . .	52.0	75.3	Total 39
	Lowest . .	32.0	49.0	
	Average . .	44.9	61.5	

2. The highest and lowest temperature, and the highest and lowest humidity inside of the school rooms examined, together with the average of the same: *a*, as found in each city; *b*, as found associated with each system of heating and ventilation; *c*, the general average of each.

3. The highest and lowest amount of carbon dioxide found per 10,000 parts of air, inside of the school rooms, and the average of the same: *a*, as found in each city; *b*, as found associated with each system of heating and ventilation; *c*, the general average of each.

4. The average amount of carbon dioxide found per 10,000 parts in each city.

Before commencing the study of these tables it might be well to remark that 70° Fahr. is a fair average standard to adopt for the temperature of a school room, and from 40 to 50 for the ideal range of humidity, and whilst the CO₂ varies in different cities, and on different days in the same city, and at different times in the same day, yet we have found that the general average in the four cities under consideration, was 4.853 parts in 10,000 parts of air, which we will be obliged to use in this case for the standard of our comparisons.

We will readily observe that tables Nos. 1 and 2 are only designed to prepare us for those which are to follow, by giving us the *outside* relations of the same conditions we are about to consider *inside* of the school rooms.

TABLE II,
Showing the highest and lowest temperature and the highest and lowest humidity outside of the buildings, together with the average of the same by systems.

		Temperature outside of the Building. Fah.	Humidity outside of the Building, based on 100 for complete saturation.	Total number of ex- aminations made.
Grossius System (with open windows, etc.)	Highest . .	68.1	95.2	11
	Lowest . .	29.5	46.3	
	Average . .	43.1	80.7	
Smead System (with no open doors, windows or transoms)	Highest . .	69.0	100.0	11
	Lowest . .	52.0	42.3	
	Average . .	52.7	64.9	
Johnston System (with open windows, etc.)	Highest . .	62.0	66.9	5
	Lowest . .	41.0	48.0	
	Average . .	49.7	59.3	
Indirect Steam (with open win- dows, etc.)	Highest . .	54.5	40.1	3
	Lowest . .	41.5	35.4	
	Average . .	48.0	37.5	
Common Stove (with open win- dows, etc.)	Highest . .	55.2	62.4	3
	Lowest . .	27.5	47.9	
	Average . .	37.4	53.4	
Direct Steam (with open win- dows, etc.)	Highest . .	41.0	89.5	2
	Lowest . .	33.0	48.8	
	Average . .	37.0	69.1	
Patric Furnace (with open win- dows, etc.)	Highest	1
	Lowest . .	. . . .	. . . .
	Average . .	32.1	89.5	
Miller Furnace (with open win- dows, etc.)	Highest	1
	Lowest . .	. . . .	. . . .
	Average . .	33.5	94.8	
Direct Steam, with open fire grate (with open windows, etc.)	Highest	1
	Lowest . .	. . . .	. . . .
	Average . .	29.0	61.9	
Direct and Indirect Steam (with open windows, etc.)	Highest	1
	Lowest . .	. . . .	. . . .
	Average . .	44.5	56.0	
				39

By studying table No. 3, you will observe that we have given the *extremes* of temperatures and humidities, as well as the average temperatures and humidities found in the four cities, *without* regard to the system of heating and ventilation which produced them ; whilst table No. 4 considers the same conditions *with* reference to the systems of heating and ventilation that produced these results ; whilst table Nos. 5 and 6 show the determinations of carbon dioxide, in the same manner as described for the temperature in tables No. 3 and 4.

The limited time and space allotted to this paper will not permit me to enter into a detailed discussion of these numerous tables, which represent a multiplicity of conditions, which modify and change the general results, all of which must be duly considered, in order to arrive at legitimate conclusions.

For the present, at least, I will have to content myself with giving you an accumulation of data, which I will be obliged to leave for you to study at your leisure ; whilst I proceed to consider some of the more prominent features of this report.

THE HEATING.

By examining this report you will observe, that we have examined quite a variety of methods of heating, which has shown a still greater range of temperature, which is especially noticeable between the floor and top of the room ; but when you come to compare the *general average* of the temperatures taken of the different systems, they vary but little at the same point of the different levels, which at the floor, in the front of the rooms show a range of from 59.5° to 68.8°, and at the mouth in front from 67.0° to 73.8°, and at the ceiling in front from 68.5° to 85.0°, whilst there is quite a difference in the range of the average of the ceiling temperatures, there is a much greater difference observed between the floor and ceiling, which ranges from 59.5° to 85.0°, or a difference of 25.5°.

Again, in the average at the rear of the room, the range of temperatures at the floor varies from 60.0° to 74.5°, and at the mouth from 64.0° to 70.2°; and at the ceiling from 70.7° to 90.0°; whilst at the rear of the rooms there was found to be a difference between the lowest average at the floor, and the highest average at the ceiling of 30.0°.

It must be remembered in the study of these results, that with the single exception of the Smead system, the temperature in every instance was modified by open doors, windows or transoms, and not unfrequently all of them. In the majority of instances the windows were open several inches between the sash and very frequently at the top, and often at the bottom ; and which not unfrequently had a strong ally in the form of an open transom or door. These methods of modifying the temperature, to a certain extent accomplished the desired results, so far as the average temperature was concerned, but at a great expense of fuel and waste of heat ; and unavoidable exposure of the pupils to cold and changeable drafts of air.

On the other hand, the Smead system of heating accomplished even better average results, and very much better individual results, at the different levels of the room, than any other system examined, and that, too, without exposing the pupils to cold changeable drafts of air from open doors, windows and transoms ; saying nothing of the economy of fuel by the prevention of the unnecessary waste of heat through these objectionable openings in the doors, windows and transoms.

THE HUMIDITY.

The amount of moisture contained in the air

TABLE III,

giving the highest and lowest temperature and the highest and lowest humidity inside the school-rooms, together with the average of the same, by cities.

LOCATION.		Temperature Front of Room.			Temperature Rear of Room.			Humidity Front of Room.			Humidity Rear of Room.			Total Number of Examinations Made.
		At the Floor	At the Mouth	At the Ceiling	At the Floor	At the Mouth	At the Ceiling	At the Floor	At the Mouth	At the Ceiling	At the Floor	At the Mouth	At the Ceiling	
sfield, Ohio . .	Highest . .	70.0	73.8	92.5	68.5	72.5	90.0	56.6	49.0	46.8	53.9	52.5	43.7	...
	Lowest . .	57.5	63.5	69.0	54.0	61.5	70.0	36.1	29.5	12.9	34.0	30.2	16.5	...
	Average . .	62.5	67.7	79.7	61.9	66.5	80.6	43.3	40.0	25.1	45.1	42.4	25.5	10
eland, Ohio . .	Highest..	73.0	77.0	81.9	70.5	75.5	85.5	39.8	39.3	31.4	45.4	45.1	31.4	...
	Lowest . .	66.5	67.0	74.0	65.0	67.0	75.0	24.0	28.7	16.6	32.0	28.3	20.4	...
	Average . .	69.5	71.9	77.2	67.8	70.9	78.2	33.5	33.6	23.9	37.2	34.8	24.3	7
mbus, Ohio . .	Highest . .	67.0	69.5	77.0	68.3	69.0	79.0	53.9	45.7	43.7	48.7	43.2	42.0	...
	Lowest . .	63.5	67.4	56.2	60.0	64.0	56.1	45.0	42.4	29.9	38.1	38.5	31.2	...
	Average . .	65.1	68.2	69.1	65.2	66.6	69.5	49.3	43.6	36.0	42.0	41.1	36.1	4
innati, Ohio . .	Highest..	73.5	73.5	74.5	74.5	74.0	75.5	97.3	97.3	97.5	97.1	97.9	91.6	...
	Lowest . .	63.0	63.1	68.0	62.5	63.0	63.5	28.5	26.8	22.9	25.6	33.0	23.5	...
	Average . .	68.3	68.6	71.2	68.8	68.8	71.1	55.0	53.2	43.4	51.1	53.5	47.3	18
id average for e 4 cities above med out of 39 aminations . . .	Highest...	69.5	71.9	79.7	68.8	70.9	80.6	55.0	53.2	43.4	51.1	53.5	47.3	Total 39
	Lowest . .	62.5	67.7	69.1	61.9	66.5	69.5	33.5	33.6	23.9	37.2	34.8	24.3	...
	Average . .	66.2	69.1	74.3	65.9	68.2	74.8	45.2	42.6	32.1	43.8	42.9	33.3	...

Total number of temperatures taken in the 4 cities, 232. Total number of humidities taken in the 4 cities, 233.

TABLE IV,

giving the highest and lowest temperature and the highest and lowest humidity inside the school-rooms, together with the average of the same.

		Temperature Front of Room.			Temperature Rear of Room.			Humidity Front of Room.			Humidity Rear of Room.			Total Number of Examinations Made.
		At the Floor	At the Mouth	At the Ceiling	At the Floor	At the Mouth	At the Ceiling	At the Floor	At the Mouth	At the Ceiling	At the Floor	At the Mouth	At the Ceiling	
sius System (with en windows, etc.)..	Highest .	72.3	73.5	85.0	73.5	74.0	90.0	67.8	61.8	66.5	66.5	59.6	55.2	...
	Lowest...	63.0	63.1	68.0	60.5	64.0	67.0	36.1	38.2	17.5	42.2	39.5	17.5	...
	Average .	66.6	67.3	74.3	66.4	68.1	74.9	48.5	46.7	38.2	50.5	47.1	37.0	11
ad System (with no en doors, windows transoms)	Highest..	73.5	76.0	81.9	74.5	75.5	81.0	97.3	97.3	97.5	97.1	97.9	91.6	...
	Lowest...	64.0	66.5	56.2	62.5	63.0	56.1	28.5	26.8	22.0	29.2	28.3	16.6	...
	Average .	68.2	70.0	71.8	68.0	68.6	70.7	52.6	50.4	44.7	50.8	51.5	44.4	11
iston System (with en windows, etc.)..	Highest..	71.8	72.0	74.5	72.0	72.1	73.5	57.9	63.5	55.1	55.3	59.0	54.8	...
	Lowest...	64.5	67.5	69.1	66.0	68.0	69.2	36.0	40.5	33.0	40.1	37.5	34.4	...
	Average .	68.5	69.1	72.2	68.8	69.6	71.5	49.0	50.7	42.7	48.7	49.6	45.0	5
rect Steam (with en windows, etc.)..	Highest..	71.0	72.0	76.0	70.0	71.5	76.5	31.6	33.0	23.2	38.1	33.6	24.4	...
	Lowest...	66.5	67.0	74.0	65.0	67.0	75.0	24.0	26.5	16.6	32.0	32.9	20.4	...
	Average .	68.8	70.0	75.1	67.6	69.8	75.8	27.5	29.4	19.8	35.0	33.3	21.9	3
mon Stove (with en windows, etc.)..	Highest..	73.0	77.0	92.5	68.0	71.0	84.0	55.6	42.7	32.8	49.3	48.1	33.7	...
	Lowest...	57.5	63.5	69.0	54.0	61.5	70.0	38.7	36.7	18.8	45.8	45.1	25.8	...
	Average .	62.8	70.2	80.3	60.3	66.2	77.0	46.2	39.7	26.2	46.5	46.6	30.3	3
ct Steam (with open ndows, etc.)	Highest..	67.5	71.5	77.0	67.2	70.5	85.5	39.8	39.3	31.4	45.4	35.9	28.1	...
	Lowest...	67.0	69.0	76.5	66.5	70.0	77.0	39.2	39.1	27.6	32.9	34.4	24.1	...
	Average .	67.2	70.2	76.7	66.8	70.2	81.2	39.5	39.2	29.5	39.1	35.1	26.1	2
ic Furnace (with en windows, etc.)..	Highest..	...	...	...	...	...	...	...	...	...	...	...	...	...
	Lowest...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Average .	60.0	64.0	78.0	62.0	65.5	90.0	41.7	40.5	20.9	42.2	42.3	16.5	1
er Furnace (with en windows, etc.)..	Highest..	...	...	...	...	...	...	...	...	...	...	...	...	...
	Lowest...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Average .	65.0	67.0	68.5	74.5	69.2	74.5	61.2	41.5	49.2	25.6	38.8	24.8	1
ct steam with open e grate (with open ndows, etc.)	Highest..	...	...	...	...	...	...	...	...	...	...	...	...	...
	Lowest...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Average .	59.5	73.8	85.0	58.0	68.2	88.0	41.2	33.0	20.1	42.1	36.5	18.9	1
ct and Indirect eam (with open win- ws, etc.)	Highest..	...	...	...	...	...	...	...	...	...	...	...	...	...
	Lowest...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Average .	63.5	69.5	77.0	60.0	64.0	79.0	53.9	45.7	31.4	39.2	38.5	31.7	1
39														

Total number of temperatures taken on all the systems, 232. Total number of humidities taken on all the systems, 233.

our school rooms should not be lost sight of. with dust, than air containing a greater amount
rm air that is too dry, is irritating to the of moisture ; whilst air that is overcharged with
piratory tract, and is more liable to be charged moisture at the same temperature creates a sul-

TABLE V,

Showing the highest and lowest amount of Carbon Dioxide per 10,000 parts inside the school-room, and the average of the same, together with the amount of CO₂ per 10,000 parts in the city air, by cities.

LOCATION.		Amount of Carbon Dioxide found in the air of the city per 10,000 parts.	Amount of Carbon Dioxide per 10,000 parts front of Room.			Amount of Carbon Dioxide per 10,000 parts rear of Room.			Total Number of examinations.
			At the Level of the Floor.	At the Level of the Mouth.	At the Level of the Ceiling.	At the Level of the Floor.	At the Level of the Mouth.	At the Level of the Ceiling.	
Mansfield, Ohio.	Highest	4.728	21.495	21.742	24.727	28.281	21.875	25.690	
	Lowest		11.104	9.855	9.914	11.318	10.016	11.473	
	Average		15.478	15.310	15.923	17.391	16.290	16.642	
Cleveland, Ohio.	Highest	5.006	17.560	16.997	17.505	17.792	17.160	16.275	
	Lowest		6.694	7.065	10.001	8.181	10.268	19.363	
	Average		12.506	12.424	12.335	13.434	13.349	13.897	
Columbus, Ohio.	Highest	4.291	14.220	15.772	15.102	18.697	15.659	14.300	
	Lowest		10.705	11.253	9.239	10.252	10.285	9.751	
	Average		12.826	14.531	11.228	14.219	13.098	12.667	
Cincinnati, Ohio.	Highest	5.590	14.765	16.991	16.610	19.388	16.765	19.228	
	Lowest		8.324	10.158	7.196	7.142	7.261	7.430	
	Average		11.740	12.878	12.770	12.357	11.869	12.442	
Grand Average for the four cities above named out of 39 examinations.	Highest	4.853	15.478	15.310	15.923	17.391	16.290	16.642	
	Lowest		11.740	12.424	11.228	12.357	11.869	12.442	
	Average		13.137	13.785	13.064	14.350	13.651	13.912	

Total number of CO₂ determinations taken in the four cities, 224.

TABLE VI,

Showing the highest and lowest amount of Carbon Dioxide per 10,000 parts inside the school-room, and the average of the same, by Systems.

			Amount of Carbon Dioxide per 10,000 parts front of Room.			Amount of Carbon Dioxide per 10,000 parts rear of Room.			Total Number of examinations.
			At the Level of the Floor.	At the Level of the Mouth.	At the Level of the Ceiling.	At the Level of the Floor.	At the Level of the Mouth.	At the Level of the Ceiling.	
Grossius System (with open windows, etc.) . . .	Highest		21.495	21.742	24.727	28.281	21.875	25.690	
	Lowest		6.741	10.768	7.196	7.142	7.261	7.430	
	Average		12.951	15.294	14.773	14.500	14.093	14.068	
Smead System (with no open doors, windows or transoms).	Highest		15.700	15.772	16.610	19.388	16.765	19.228	
	Lowest		10.760	11.255	9.239	11.750	10.016	10.824	
	Average		13.437	14.216	13.219	14.685	13.682	14.605	
Johnston System (with open windows, etc.) . . .	Highest		14.130	16.991	16.150	15.741	12.511	15.780	
	Lowest		9.669	10.158	9.896	8.757	9.178	10.025	
	Average		10.352	12.866	12.574	11.897	10.841	11.972	
Indirect Steam (with open windows, etc.) . . .	Highest		11.872	11.850	11.181	12.881	14.731	16.275	
	Lowest		6.694	7.065	10.001	8.181	10.268	9.363	
	Average		8.754	9.557	10.647	10.240	12.473	12.096	
Common Stove (with open windows, etc.) . . .	Highest		13.872	12.378	13.926	16.098	15.391	15.73	
	Lowest		11.104	9.855	10.416	11.318	11.001	11.47	
	Average		12.683	10.802	11.911	14.442	13.173	13.53	
Direct Steam (with open windows, etc.)	Highest		17.560	16.997	17.505	17.792	17.160	15.277	
	Lowest		14.401	16.753	14.085	15.550	14.156	14.682	
	Average		15.910	16.875	15.795	16.671	15.658	14.979	
Patric Furnace (with open windows, etc.) . . .	Highest		19.127	17.499	16.493	16.418	16.971	18.223	
	Lowest								
	Average								
Miller Furnace (with open windows, etc.) . . .	Highest		14.392	Lost	13.682	13.286	Lost	14.221	
	Lowest								
	Average								
Direct Steam, with open grate (with open windows, etc.)	Highest		12.425	11.847	9.914	11.751	14.401	14.132	
	Lowest								
	Average								
Direct and Indirect Steam (with open windows, etc.)	Highest		10.705	11.253	10.222	10.252	10.285	9.751	
	Lowest								
	Average								

Total number CO₂ determinations taken on all the systems, 224.

try, oppressive atmosphere, which will predispose the pupils to "catching cold" on leaving the school room.

By examining these charts and tables you will observe, that as a rule, the humidity decreases the production of artificial heat, as the temper

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CINCINNATI, O.																																	
SCHOOL ROOMS IN																																	
Number.	Date and time of day inspection was made.	Name of School Building.	Name of School Room.	No. of Pupils Present.	No. of cubic feet of air contained in room.	Temperature outside of building.	Humidity outside of building.	Barometric pressure in inches.	State or Condition of the Weather.	Kind of Heating Apparatus in use.	System of Ventilation Employed.	No. cubic ft. of fresh air supplied per hour.	No. of cubic ft. of foul air discharged per hour.	Temperature Front of Room.			Temperature Rear of Room.			Humidity front of Room.			Humidity Rear of Room.			Amount of Carbon Dioxide found in the air of the city per 10,000 parts.	Amt. Carbon Dioxide per 10,000 parts front of room.			Amt. Carbon Dioxide per 10,000 parts rear of room.			
														At the Floor.	At the Mouth.	At the Ceiling.	At the Floor.	At the Mouth.	At the Ceiling.	At the Floor.	At the Mouth.	At the Ceiling.	At the Floor.	At the Mouth.	At the Ceiling.		Level of Floor.	Level of Mouth.	Level of Ceiling.	Level of Floor.	Level of Mouth.	Level of Ceiling.	
1	Feb. 10, 1891, 3 P.M.	New building cor Canal and Elm.	No. 10.	58	9,780	41.0	56.7	29.78	Bright and cold.	Smead system	Smead system	57,420	Could not determine.	70.2	71.5	72.0	69.8	69.6	71.3	28.5	31.6	22.9	29.2	33.0	23.5	6.038	11.102	13.970	16.610	14.658	12.228	13.377	
2	Feb. 11, 1891, 2:30 p.m.	New building cor Canal and Elm.	No. 16.	48	9,780	49.5	54.8	29.71	Bright and cold.	Smead system	Smead system	44,040	Could not determine.	64.0	69.2	69.0	65.5	65.6	68.5	38.5	26.8	27.0	40.0	44.5	32.4	6.038	13.039	14.187	16.037	19.388	16.765	19.228	
3	Feb. 12, 1891, 2:15 p.m.	New building cor Canal and Elm.	No. 13.	48	12,333	68.0	73.1	29.17	Cloudy, dark day	Smead system	Smead system	4,740	Did not determine.	73.5	73.5	74.5	74.5	73.2	75.0	63.2	63.1	67.9	61.6	68.2	61.9	6.038	14.765	14.361	14.244	16.892	16.718	17.540	
4	Feb. 13, 1891, 2:20 p.m.	New building cor Canal and Elm.	No. 18.	54	12,109	69.0	72.8	29.21	Cloudy, dark day	Smead system	Smead system	4,740	Not determined.	71.5	72.0	73.5	73.0	72.8	74.2	69.8	68.9	63.0	67.3	65.8	60.9	6.038	15.700	14.455	15.122	15.920	16.298	16.940	
5	Feb. 16, 1891, 10:45 a.m.	New building cor Canal and Elm.	No. 6.	45	11,954	61.5	85.5	29.39	Raining.	Smead system	Smead system	6,360	Did not determine.	69.0	66.5	70.0	67.5	66.3	69.2	67.4	76.3	65.8	69.2	73.8	67.6	6.038	13.770	14.217	12.682	12.500	13.581	13.555	
6	Feb. 16, 1891, 11:25 a.m.	New building cor Canal and Elm.	No. 1.	49	11,902	61.5	100.0	29.38	Raining.	Smead system	Smead system	14,340	Did not determine.	68.5	68.5	71.0	62.5	63.0	63.5	97.3	97.3	97.5	97.1	97.9	91.6	6.038	10.760	11.255	11.049	11.750	11.210	10.824	
7	Feb. 18, 1891, 2 p.m.	Cor. Elm and Adams sts	No. 9.	46	8,898	37.0	89.2	29.82	Wet and sultry, turning into snow.	Grossius heater in the room.	Foul air vents, windows and doors.	Could not determine.	Could not determine.	69.5	65.2	68.0	67.5	65.1	67.0	67.8	44.1	40.5	66.5	48.7	41.5	6.038	12.610	11.520	12.501	14.030	11.091	10.690	
8	Feb. 18, 1891, 2:45 p.m.	Cor. Elm and Adams sts	No. 16.	48	9,016	43.0	87.9	29.81	Wet, sultry day.	Grossius system same as above.	Foul air vents, windows, doors and transoms.	Could not determine.	Could not determine.	63.0	63.1	68.5	63.5	66.3	69.0	37.5	45.2	32.4	40.3	41.5	37.0	6.038	9.088	Lost	15.031	8.630	9.322	12.720	
9	Feb. 19, 1891, 2 p.m.	Cor. Elm and Adams sts	No. 15.	51	9,016	44.0	95.2	29.73	Wet day.	Grossius system same as above.	Same as above	No approx. est. made.	No approx. est. made.	65.5	66.0	69.0	67.1	67.0	68.5	49.1	45.0	43.2	46.2	45.9	40.7	6.038	10.468	11.240	11.340	11.417	10.400	10.310	
10	Feb. 19, 1891, 2:30 p.m.	Cor. Elm and Adams sts	No. 14.	35	8,428	44.0	95.2	29.73	Raining.	Grossius system same as above.	Same as above	No est. given.	No estimate given.	64.3	66.3	74.0	66.2	67.5	73.5	48.2	45.9	35.8	46.2	44.1	37.2	6.038	8.815	Bottle broke	11.392	8.742	See note 2.	9.182	
11	Feb. 20, 1891, 2 p.m.	Cor. Elm and Adams sts	No. 3.	62	8,820	68.1	78.3	29.28	Windy and wet.	Same as above	Same as above	No est. given.	No estimate given.	72.3	73.5	71.5	73.5	74.0	75.5	62.5	57.6	66.5	56.9	54.2	52.2	6.038	8.324	10.768	10.111	8.599	7.738	7.991	
12	Feb. 20, 1891, 2:35 p.m.	Cor. Elm and Adams sts	No. 2.	49	8,232	67.9	75.1	29.28	Cloudy, wet and windy.	Same as above	Same as above	Could not determine.	Could not determine.	72.0	71.0	72.5	70.1	71.0	72.9	53.9	61.8	56.3	61.3	59.6	55.2	3.494	6.741	Not taken	7.196	7.142	7.261	7.430	
13	Feb. 24, 1891, 1:45 p.m.	Findlay st. bldg., 20th Dist.	No. 17.	47	9,360	62.0	66.5	29.26	Cloudy.	See foot note 1.	Foul air shafts, windows and doors.	Could not determine.	Could not determine.	71.5	72.0	74.5	72.0	72.1	73.5	57.9	58.2	55.1	53.9	55.9	54.8	7.395	13.835	12.264	11.843	12.441	Lost.	10.672	
14	Feb. 24, 1891, 2:30 p.m.	Findlay st. bldg., 20th Dist.	No. 20.	38	10,920	61.5	66.9	29.25	Cloudy.	Same as above	Same as above	Same as above.	Same as above.	71.8	70.0	73.0	71.0	70.0	72.5	54.5	63.5	52.5	55.3	59.0	53.0	7.308	9.669	10.158	9.896	8.757	9.178	10.025	
15	Feb. 25, 1891, 1:45 p.m.	Findlay st. bldg., 20th Dist.	No. 10.	48	9,744	42.0	57.7	29.28	Bright and sunny day.	Same as above	Same as above	Same.	Same.	68.0	67.5	69.1	67.2	68.0	69.2	36.0	40.5	39.2	40.2	44.5	41.1	7.308	13.509	13.291	13.482	12.320	12.511	12.280	
16	Feb. 25, 1891, 2:45 p.m.	Findlay st. bldg., 20th Dist.	No. 13.	37	10,980	42.0	57.7	29.22	Clear and sunny.	Same as above	Same as above	Could not measure on account of variable currents same as above.	Could not measure on account of variable currents same as above.	64.5	68.0	73.5	66.0	68.5	72.0	55.3	51.1	33.9	54.3	51.5	41.7	4.739	10.618	11.627	11.501	10.230	Did not take.	11.106	
17	Feb. 26, 1891, 1:45 p.m.	Findlay st. bldg., 20th Dist.	No. 3.	33	10,214	41.0	48.8	29.48	Bright day.	Same as above	Same as above	Same as above.	Same as above.	67.0	68.3	71.0	68.2	69.4	70.5	41.5	40.5	33.0	40.1	37.5	34.4	4.981	14.130	16.991	16.150	15.741	Did not take.	15.780	
18	Feb. 27, 1891, 1 to 2 p.m.	White & Sykes private school	No. A.	30	9,240	33.5	94.8	29.54	Clear day	Miller warm air furnace.	Foul air vents and windows.	Was not taken.	Was not taken.	65.0	67.0	68.5	74.5	69.2	74.5	61.2	41.5	49.2	25.6	38.8	24.8	5.181	14.392	Not taken	13.682	13.286	Not taken.	14.221	

Note 1.—Johnson system, with furnace in the basement in which was water pans to keep the air moist.

Note 2.—Used bottle for outside air.

SCHOOL ROOMS IN CLEVELAND, O.

19	March 9, 1891, 2 to 3 p.m.	to Rockwell.	No. 10.	51	10,192	41.0	48.8	29.25	Cloudy and spitting snow.	Steam radiators, with direct steam heat.	Windows and foul air vents.	Could not determine.	Could not determine.	67.0	69.0	76.5	66.5	70.5	77.0	39.2	39.1	27.6	45.4	34.4	28.1	5.006	17.560	16.997	14.085	15.550	17.160	15.277
20	March 9, 1891, 3 to 4 p.m.	St. Clair Street.	No. 12.	47	11,310	33.0	89.5	29.31	Cloudy and snowing.	Direct steam heat.	Foul air shafts connect'g with outside and doors closed.	Could not determine.	Could not determine.	67.5	71.5	77.0	67.2	70.0	85.5	39.8	39.3	31.4	32.9	35.9	24.1	5.006	14.401	16.753	17.505	17.792	14.156	14.682
21	March 10, 1891, 10 to 11 a.m.	Central High Sch.	No. 10.	54	17,280	41.5	40.1	29.68	Bright, sunny day.	Indirect steam.	Ventilators, windows and doors.	Could not determine.	Could not determine.	69.0	72.0	76.0	68.0	71.5	76.5	27.0	26.5	19.8	38.1	33.5	21.0	5.006	11.872	11.850	10.760	12.881	14.731	16.275
22	March 10, 1891, 11 a.m. to 12 m.	Outwaite School Bldg.	No. 11.	52	12,544	48.0	37.0	29.68	" " "	Indirect steam.	Cold air conduit, foul air vents, windows and doors.	Could not determine.	Could not determine.	66.5	67.0	74.0	65.0	67.0	76.0	24.0	28.7	23.2	35.1	39.9	20.4	5.006	6.694	7.065	11.181	9.658	12.421	10.650
23	March 11, 1891, 9 to 10 a.m.	Case Avenue.	No. 12.	50	11,934	54.5	35.4	29.59	" " "	Indirect steam.	Windows, doors, transom and foul air vents.	Could not determine.	Could not determine.	71.0	71.2	75.5	70.0	71.0	75.0	31.6	33.0	16.6	32.0	33.6	24.4	5.006	7.698	9.756	10.001	8.181	10.268	9.363
24	March 10, 1891, 2 to 3 p.m.	Scranton Street.	No. 2.	73	12,852	44.0	44.6	29.60	Clear, with sunshine.	Smead system.	Smead system.	Anemometer disarranged; could not determine.	Anemometer disarranged; could not determine.	72.5	76.0	81.9	70.5	75.5	81.0	34.5	32.2	22.0	32.5	28.3	21.1	5.006	15.450	12.175	11.425	14.221	11.582	15.392
25	March 11, 1891, 2:15 to 3 p.m.	Sterling Ave. Re-lief House.	No. 22.	55	8,700	55.2	47.9	29.49	Clear and bright.	Ordinary stove.	Windows, doors and transom.	Could not determine.	Could not determine.	73.0	77.0	79.5	68.0	71.0	77.0	38.7	36.7	27.2	44.5	45.1	31.4	5.006	15.872	12.378	11.392	15.911	13.127	15.733

SCHOOL ROOMS IN COLUMBUS, O.

26	March 25, 1891, 2 to 3 p.m.	Fifth Avenue.	No. 3.	65	10,075	53.0	45.3	29.58	Bright sunshine.	Smead System.	Smead system.	Could not determine.	Could not determine.	67.0	68.0	69.5	68.3	69.0	70.1	45.9	42.4	43.7	38.1	43.2	42.0	4.291	14.220	15.328	15.102	12.899	12.765	14.300
27	March 26, 1891, 10 to 11 a.m.	Garfield Avenue.	No. 11.	59	11,492	44.5	56.5	29.34	Clear, turning to cloudy.	Direct and indirect steam.	Foul air vents, windows, doors and transoms.	Could not determine.	Could not determine.	63.5	69.5	77.0	60.0	64.0	79.0	53.9	45.7	31.4	39.2	38.5	31.7	4.291	10.705	11.253	10.222	10.252	10.285	9.751
28	Mar. 25, 1891, 10:30 to 11:30 a.m.	High School.	No. 8.	24	11,492	47.5	59.4	29.63	Bright, sunny day.	Smead system.	Smead system.	" " "	" " "	64.0	68.0	56.2	65.2	66.5	56.1	52.7	42.4	39.1	48.7	43.2	39.8	4.291	12.830	15.772	9.239	15.031	15.695	13.561
29	Mar. 25, 1891, 3:15 to 4 p.m.	Eighth Avenue.	D Prim'y	66	11,200	53.0	42.3	29.54	Bright, clear.	Smead system.	Smead system.	" " "	" " "	66.0	67.4	74.0	67.5	67.3	72.8	45.0	44.1	29.9	42.0	39.8	31.2	4.291	13.551	15.772	10.350	18.697	13.648	13.056

SCHOOL ROOMS IN MANSFIELD, O.

30	March 3, 1891, 2 to 3 p.m.	to High School Bld'g.	For names of School Rooms see Note 1.	71	25,541	37.0	80.7	28.56	Wet, cloudy, turning into snow.	See note 2.	See note 5.	Could not determine.	Could not determine.	69.5	72.0	76.0	65.5	67.0	74.5	41.6	41.7	35.8	53.9	52.5	38.1	4.728	16.251	14.430	15.131	28.281	19.792	25.690
31	March 3, 1891, 3 to 4 p.m.	to High School Bld'g.		74	25,447½	38.0	84.2	28.582	Wet, cloudy, and snowing.	Grossius system. Used two Stoves.	See note 6.	Could not determine.	Could not determine.	70.0	71.0	74.0	68.5	69.8	74.5	48.8	49.0	46.8	51.2	52.0	43.7	4.728	21.495	21.523	23.335	22.566	21.875	20.176
32	March 6, 1891, 3 to 4 p.m.	to Marion Ave. Bld'g.		57	12,852	33.0	59.8	28.62	Snowing	Grossius system; one heater.	Windows, ventilators at floor, transoms and doors.	200 lin. feet one mom't, the next nothing.	80 lin. ft. one moment, the next nothing.	63.0	65.0	85.0	67.0	72.5	90.0	47.0	46.4	21.1	45.9	40.1	17.5	4.728	18.821	21.742	24.727	17.547	17.475	15.671
33	March 4, 1891, 3 to 4 p.m.	to Third Ward Bld'g.		54	12,150	29.5	66.1	28.9	Bright and clear, snow on ground.	Grossius system, one heater.	See note 7.	Could not approximate.	Could not determine.	60.0	65.0	75.0	60.5	64.0	75.5	41.7	39.5	24.4	42.2	40.8	26.5	4.728	13.988	14.184	15.705	14.640	17.225	16.467
34	March 5, 1891, 3 to 4 p.m.	to Third Ward Bld'g.		44	13,050	33.0	46.3	29.20	Bright, sunny day.	Grossius system, one heater.	See note 8.	Could not determine.	Could not determine.	64.0	66.0	84.5	61.0	65.0	83.0	36.1	38.2	17.5	45.2	39.5	18.7	4.728	15.869	16.949	16.038	17.967	18.755	18.426
35	March 6, 1891, 10.45 to 12 m.	Fourth Ward Building.	44	15,232	32.1	89.5	28.74	Damp and cloudy.	See note 3.	See note 9.	Could not determine.	Could not determine.	60.0	64.0	78.0	62.0	65.5	90.0	41.7	40.5	20.9	42.2	42.3	16.5	4.728	19.127	17.499	16.493	16.418	16.971	18.233	
36	March 5, 1891, 10.55 a.m.	Children's Home.	40	6,300	29.0	61.9	29.13	Clear, sunny day, snow on ground.	Steam, with open fire grate.	See note 10.	30 cub. feet per min.	80 cubic feet per minute.	60.0	64.0	78.0	62.0	65.5	90.0	41.7	40.5	20.9	42.2	42.3	16.5	4.728	19.127	17.499	16.493	16.418	16.971	18.233	
37	March 6, 1891, 9.30 to 10.30 a.m.	Catholic Building.	59	9,100	32.0	80.2	28.81	Cloudy	Smead System	Smead system, with six foul air ventilators at the floor.	51.400	32.400	64.0	69.5	78.3	64.0	66.5	77.0	36.2	29.5	12.9	34.0	30.2	18.9	4.728	12.425	11.847	9.914	11.751	14.401	14.132	
38	March 4, 1891, 10 to 11.30 a.m.	Pleasant Hill School Building.	19	7,540	29.5	62.4	28.53	Clear, ground covered with snow.	See note 4.	None, except windows and doors.	Unknown.	Unknown.	57.5	59.0	92.5	59.0	59.0	84.0	44.3	44.3	18.8	45.8	45.8	25.8	4.728	12.626	14.901	13.553	10.416	10.016	12.783	
39	March 5, 1891, 10 to 10.45 a.m.	Maple Grove . . .	18	11,799	27.5	50.0	29.12	Clear and bright, snow on ground.	One common ordinary stove.	Two registers 12x18 in., open in the ceiling.	Unknown.	Unknown.	58.0	63.5	69.0	54.0	61.5	70.0	55.6	42.7	32.8	49.3	48.1	33.7	4.728	13.075	10.174	13.926	11.318	11.001	11.473	

increases. Yet this condition is very greatly modified by the humidity of the outside atmosphere. For example, take a wet, sultry day, when the humidity of the external air is almost at the point of complete saturation, and at the same time the outside *temperature so high*, that a little artificial heat is required, or can be tolerated, the humidity will be found to be exceedingly high in the school rooms, as a natural result of a combination of circumstances. Again, when the same degree of humidity outside, associated with a *cold raw air* requiring a considerable quantity of artificial heat to make the school room comfortable, the humidity of the school room, whilst somewhat high, will be found much lower than under the former conditions; and at the same time the average temperature will be almost or practically the same.

You will observe by table No. 4, that the average humidity at the floor in front of the school rooms, in the various systems varies from 5 to 61.2; whilst at the mouth it ranges from 4 to 50.7; and at the ceiling from 19.8 to 2. At the rear of the room, it varies at the floor from 25.6 to 50.8, whilst at the mouth it ranges from 33.3 to 51.5; and at the ceiling from 16.5 to 45.0.

By these you will observe that even many of the general averages are entirely too low, although few of them are found to be too high. Notwithstanding all this when we examine the itemized charts and study the individual results in isolated cases, you will find still greater variations of the humidity, in different parts of the same room; and especially so when no regular system of circulating and changing the air has been adopted.

On the other hand, when a regular system of circulating the air has been adopted, it is remarkable how the results are modified regarding the amount of moisture contained in the air at different points in the same room, and even in different rooms in the same building.

CARBON DIOXIDE.

Notwithstanding we have advocates at the present time, who question the injurious effects of even the quantities of carbon dioxide in the air of school-rooms, yet I am not prepared to accept their theories, without more than circumstantial evidence to verify their correctness.

We must bear in mind that the presence of the quantities of CO_2 does not necessarily make physical changes in the air that are readily perceived by the senses.

It is true that immense quantities of CO_2 will produce fatal asphyxia, yet it never has been, and no doubt never will be found in such immense quantities as to produce death in school-rooms; but it is found in sufficient quantities, in the majority of school-rooms, as to act as a

slow poison from day to day, during a large portion of the scholars' school life, in proportion to the quantity of CO_2 present, and the corresponding restrictions on the natural supply of fresh air.

The question of where the carbon dioxide prevails in the largest quantities, in school-rooms, has long since been a mooted question. The old authors, as well as public opinion, placed it at the *top* of the room; and as a result of their belief, advised making provisions for its escape at or near the ceiling. On the other hand, the more recent writers affirmed that it prevailed in the greatest quantities at or near the *floor*, of a given room; and cited you to the fact that it was heavier than air, and of necessity must accumulate at the bottom; and produced as evidence to prove their theory, the old cave story—in which a man can walk with impunity, while his dog would be asphyxiated with carbon dioxide, which they backed with the experiment of the model house, in which a large, medium, and short lighted candle was placed, and the air excluded—when the short candle would go out first, the medium next, and the long candle last.

But you must remember that in neither of these cases, is there any circulation of air, and consequently, barring the law of diffusion of gases, there is nothing to intermix the CO_2 with the sundry strata of air, and modify the natural laws of gravitation. On the other hand, we have quite a different condition of affairs in the school-room, which modify the primary laws of gravity, and which give us entirely different results than the imaginary attributes from which we have heretofore woven our theoretic web of supposed conditions regarding the CO_2 , which, however, in fact did not exist, as you will observe by a careful study of the charts and tables which accompany this report.

By turning to table No. 6, you will observe that the highest average of CO_2 found associated with any particular system of heating and ventilation, in the *front* of the room at the level of the floor, was 19.127 parts per 10,000, and the lowest average was 8.754; whilst at the *mouth* the highest average was found to be 17.499, and the lowest at the same level was 9.557; and at the *ceiling* the highest average was found to be 16.493, and the lowest 9.914; which only shows a difference of 1.160 parts in 10,000, between the lowest average at the floor and the lowest average at the ceiling, in favor of the ceiling; and only 2.634 parts between the highest average at the floor, and the highest average at the ceiling, in favor of the floor.

Again, in the *rear* of the room, the highest average of CO_2 at the floor was 16.671, and the lowest 10.240; whilst at the mouth it was 16.971 against 10.285, and at the ceiling 18.223, as compared with 9.751; with only a fraction of .489 difference between the lowest average at the

mouth and the lowest average at the ceiling, in favor of the latter; whilst the difference between the highest average at the ceiling, and the highest average at the floor, was only 1.552 in favor of the ceiling. But go with me, if you please, to table No. 5, and there turn to the grand average of the four cities, taken from 224 determinations, and you will find that there is only a fraction of a difference between the amount of CO_2 at any level of the room, either at the rear or front; which grand average shows in the front of the rooms 13.137 at the floor, and 13.785 at the mouth, and 13.064 at the ceiling. Whilst in the rear of the rooms, it shows 14.350 at the floor, 13.651 at the mouth, and 13.912 at the ceiling; or in other words, only the fraction of .075 difference between the floor and the ceiling in the front of the rooms, in favor of the floor; and but .438 difference between the floor and the ceiling at the rear of the rooms, in favor of the former.

It seems to me that this investigation ought to settle, without a question, the problem regarding the location of the CO_2 in the school-rooms of to-day, and especially those which are heated artificially, and to prove beyond a shadow of a doubt, that CO_2 is an omnipresent factor, in practically the same relative proportions at all levels of a school-room, whether ventilated at the top, sides or the bottom, or all.

GENERAL REMARKS.

The next important question that confronts us, after having obtained all this "array of facts and figures," is—how shall we proceed to heat and ventilate our school-rooms in the most sanitary, economical, practical and scientific manner? In answer to these questions I will say:

1st.—That to heat and ventilate our school-rooms in the most *scientific* manner will require a system of heating and ventilation which will avoid the necessity of having either open doors, windows or transoms, and which will at the same time supply each scholar with not less than 1,000 cubic feet of fresh warm air every hour, and which will remove a corresponding quantity of foul air at the same time, without subjecting any scholar in the room to an uncomfortable draught of either cold, or over-heated air. Sufficient fresh warm air should be supplied to each scholar, at an average temperature of about 70° , and an average humidity ranging from 40 to 50; whilst the foul air should be removed sufficiently rapid as to prevent an accumulation of CO_2 to exceed 10 parts in 10,000 parts of air at any time, or in any part of the room, or a variation of the temperature between the floor and the ceiling to exceed 10° Fahr., or at any level of the same between the front and the rear, or either, to exceed 5° Fahr.

2nd.—To accomplish these results in the most *economical* manner will require an air warmer, with sufficient capacity to heat the required

amount of air to the desired temperature without superheating it (for under no circumstances should it be allowed to pass over red-hot iron plates, and which fresh warm air should be discharged in a gentle current at the floor, and exhausted the same level at the sides of the room, without the assistance of a top ventilator or the aid of an open door, window or transom. But if top ventilators *are* used at all, they should only be used to cool the room, in the event it became *over* heated from any cause; outside of this they are of no value whatever, except to wantonly waste our heat and fuel, without giving us any advantages in return for their loss.

3rd.—I am fully aware of the fact, that it is usually a very difficult task to realize, in a practical manner, the theories that fill us with enthusiasm when demonstrated on paper; and furthermore that there is perhaps *no* system of heating and ventilation in use at the present time, that is capable of carrying out in every particular, and in all possible circumstances, the ideal heating and ventilating of the average school-room, yet after years of investigation, and examining scores of different kinds of heating and ventilating apparatus, without "either fear or favor" to any one I am thoroughly convinced that there is no system of heating and ventilating at the present time, that will come so *near* fulfilling the requirements of the ideal methods of accomplishing these results, in the most sanitary, economical, practical and scientific manner, as the so-called Smead system. In making the above assertion I do so in all candor, and without personal favor or intentional disparagement to any one, but simply as the legitimate conclusion I have derived from actual facts, obtained from repeated personal and scientific investigations.

CONCLUSION.

I trust you will pardon the prosy character of this report, which is largely composed of "facts and figures," which to obtain, has been a tedious, irksome, and an expensive task. Yet if only it serves the purpose of securing a better heated and more liberal supply of God's pure air to the rising generations, who spend (from a hygienic standpoint at least) the very best and most important part of their lives in our public and private schools, I will feel that all my labors have been fully repaid.

Mansfield, O., April 27, 1891.

KATZENJAMMER.—Resorcin is said to act admirably in cases of nausea and depression following a carouse. It is given in the dose of five to ten grains in plenty of water, flavored with syrup of orange peel, and may be repeated once or twice at intervals of half an hour. A single dose of ten grains is, however, said to be usually sufficient.—*N. Y. Med. Record.*

THE VALUE OF WEAK CYLINDERS FOR THE RELIEF OF EYE MUSCLE STRAIN.

Read in the Section on Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C. May, 1891.

BY JULIAN J. CHISOLM, M.D.,

PROFESSOR OF EYE AND EAR SURGERY IN THE UNIVERSITY OF MARYLAND, SURGEON-IN-CHIEF OF THE PRESBYTERIAN EYE, EAR AND THROAT CHARITY HOSPITAL OF BALTIMORE CITY.

Three years ago I read a paper before the ophthalmological section of the American Medical Association, on the value of 0.25 D. cylinder in the correction of the lesser grades of astigmatism. My additional experience confirms the position which I then took.

The annoyance occasioned by eye muscle strain demands recognition from complaining patients whose heads will ache when the eyes are much used. All astigmatic eyes do not suffer in like proportion. There are three factors at work that bring about annoyance. The first is the amount of eye work required by a badly shaped cornea; a second factor is the degree of fault; and a third is found in the nervous susceptibility of the patient.

As to the first condition, the amount of work required. The majority of astigmatic eyes only exhibit the trouble under forced application. Eyes which have done faithful and painless duty for many years are suddenly called upon for an unusual effort. They break down with pain, which then returns upon moderate use with a persistency that makes eye work unsatisfactory, and the individual miserable. The defect had always existed, and would not have been brought out had the additional labor not been undertaken. This is constantly illustrated in over worked advanced school children at examination periods. They complain of painful eyes and head from the too close application, when their parents, who exhibit the same degree of irregular refraction, have never suffered. This complaint is especially made if the young patient is of the nervous type, is rapidly growing, and is more anxious to secure good school grades than to take open air exercise. Hence girls suffer more than boys.

Physicians are seldom consulted by healthy people who have no physical complaints; and likewise ophthalmic surgeons only see those whose eyes are not comfortable. Such eyes are not necessarily inflamed; nor is there always dull vision. Most frequently the eyes themselves look in every way well, but with the inability to use them with comfort. The majority of those who consult me for painful eyes and head see clearly, and so state promptly: "It is not that my eyes are not sharp seeing, for I can see any small object that any one else can see, but they are not comfortable under use and my head aches when I read."

These two facts are daily noticed. So constant are they complained of that rarely do I not find irregular refraction when these symptoms are present, headache being the chief. My experience enables me to formulate, at least for my own guidance, this axiom: *Headache under eye use, with acute vision, in by far the majority of cases, means astigmatism, and usually of low degree.* If the irregularity of the cornea is not detected, it is because it has not been carefully sought for. It also means that the headache under eye use will not be relieved by any eradication or course of treatment until this irregularity of refraction is found and corrected.

Many specialists act upon the belief that V. $\frac{2}{20}$ is incompatible with annoying irregular curvatures in the cornea, and that it is needless to seek for astigmatism in such eyes. In cases of eye pain with acute vision their attention is therefore diverted from the true cause of the eye trouble to the examination for irregular action in the socket eye muscles, of which there is endless variety both in eyes that give no trouble and eyes that are painful. I find V. $\frac{2}{20}$ in one-third of my astigmatic cases; and this good vision among my most suffering patients. The most marked relief, and the most brilliant results from the adjustment of cylinder glasses I obtained among this class. Many of them had been under treatment by specialists and were wearing spherical lenses for near work but with no comfort. These cases are often mistaken for accommodative faults, formerly known as muscular asthenopia, and for which 1. + D. was the best known remedy. In former years I prescribed such glasses fifty times where I now have occasion to prescribe them once.

I often wonder what has become of the hosts of hyperopic eyes that I formerly saw and treated with spherical convex lenses. That I see the same character of eyes now I am quite sure, but no longer from the same standpoint. A more careful examination proves these cases to have been mild grades of astigmatism, often myopic. The same class still come to me from other specialists who are holding the views that I formerly acted upon, before I found out my mistake.

Years back I became aware that the most annoying irregularities of the cornea are the slight deviations, which are still compatible with sharp vision, V. $\frac{2}{20}$ or $\frac{3}{20}$, seldom less than $\frac{2}{40}$, and frequently the greater fault in one eye only. In my most ailing patients I so constantly find the lesser irregularities that I have been forced to the conclusion that in the high degrees of astigmatism the eye ceases to make the effort for acute vision, recognizing its inability, and hence the less muscular strain, and consequently less headache. In the small irregularities of corneal curvature, headache on eye use is the most constant and conspicuous symptom. It is more common than eye

ache although the two usually go together. When patients with refractive errors consult me complaining of defective sight and no pain in the head, as a rule astigmatism is either excessive or I find none of it. I accept as a most valuable aid in the search after astigmatism persistent headache on eye use. As I have previously said the reading of Jager No. 1, with V. $\frac{20}{20}$, by such patients are to me no evidences that a painful degree of astigmatism does not exist. With this acute vision patients with over-strained eye muscles often cannot read with comfort ten minutes, day-light even annoys, and fixation for a short time, as looking into the face of a friend while conversing or into the plate while eating, excites nausea.

In the casual examination of these patients, some of them at first see no difference in the tinting of the lines on the clock dial chart. They will repeatedly say, "I see no difference whatever, in the color. To me they are all exactly alike." This would look as if there was no astigmatism. After these repeated trials and assurance, most examiners would abandon the idea of irregular refraction. But I say to myself "here is a case of headache on eye use for near work. This patient, feeling well, can soon read herself into a headache. In my experience a low degree of astigmatism is by far the most painful source of this discomfort. I will continue my search until I feel assured that it does not exist." By perseverance in the examination of one eye at a time, I will eventually get out of the patient that all the clock dial lines are not exactly of the same tint. Some will now have a slight grayish, bluish or brownish tint, which was not perceptible at the first examination of the card. Once they detect the difference they never afterward lose it. Some lines now are not as clean black as other lines, and a weak cylinder will clear all up better than the duplicate number of a weak spherical lens. Some patients will persist in the statement that there is a uniformity in color for all the lines until homatropia is used, when the slight difference which is the cause of all the eye trouble is discovered. The adjustment and wearing of proper cylinders, 0.25 D. + or —, will promptly put an end to the eye and head discomforts which had been the torment of the patient for months or even years.

In my case book hundreds of such patients have been entered; persistent headache on eye use, the constant complaint; a low degree of astigmatism always found; a 0.25 D. cylinder prescribed with the result of treatment recorded at varying periods, days, weeks or months after the glasses had been given. "No headache since I have worn the glasses except on the occasion when I tried to read without them." By the wearing of these weak cylinders of 0.25 D., in numbers of cases patients have suddenly jumped

up from ten minutes reading with pain, to many hours continuous reading without any head discomfort whatever.

I will give but one illustration from among this very numerous class of recorded cases, because, on account of her professional history, it was of more than usual interest. The young lady was from New York City, was 18 years of age and well developed. She had been under more or less constant treatment on account of eye discomfort for five years, and had been removed from school because she could not study without pain in the head. When the first consulted ophthalmic surgeon who had her case under observation, had exhausted all theories and treatment with no relief, and had finally found weak recti muscles for which he advised tenotomy, the father refused to have any operation performed. The young lady, after an interval and still suffering, was put under the care of a second specialist. Guided by the experience of the first, as related by herself, he sought diligently to procure her relief. One by one all remedies were tried. Spherical lenses, practicing with prisms, internal medication, rest, but all with no benefit. When he had exhausted his resources he also suggested muscle cutting as the only untried remedy. He thought that relief would come surely through this surgical treatment. The father again declined to permit any operation. In the course of time this healthy looking girl, under blue glasses, was brought to my office for treatment. Her vision was $\frac{20}{20}$ and for one or two minutes she could read No. 1 of Jager. She was one of those who insisted that the test lines were all of uniform color, but she suffered with more or less constant headache. Under homatropia, horizontal lines seemed a little shady but not markedly so. Still she preferred a 0.25 + C.O. to a 0.25 + S in brightening up the entire face of the card. When the effects of the mydriatic had passed off, although the lines had again resumed their uniform brightness, she found relief in a 0.25 — C 90° rather than 0.25 + C.O. She was ordered the weak concave cylinder for constant wear. Before two weeks had passed by she could read for hours, night or day, with no discomfort whatever. Her headache returned whenever, for experiment's sake, she would put off her weak cylinder glasses, even for a short time. The relief from suffering was positive and permanent. I had a visit from the young lady one year after I had first seen and adjusted glasses for her. She still wore the weak cylinders and had no trouble whatever. She had resumed her education and as a diligent student was making up for lost time.

The necessity for recognizing the lesser degrees of astigmatism forces itself upon me daily. Long continued and persistent headache with eyes paining on use, uninfluenced by rest, medi-

tion, or hygienic influences, and relieved at once by a 0.25 D.C., ought to be proof enough of the necessity for discovering these low degrees of deviation from the true corneal curves. In many sensitive persons the verification of the diagnosis and the advantages of the treatment to the comfort of the individual are conspicuously shown when the cylinders are suddenly reversed. Pain and head discomfort seem immediately brought on by the mal-position of the axis of the lens. When the restful condition when the cylinder is placed at the proper angle in the trial frame.

This 0.25 C. not only makes good vision easy, but often will make faulty vision good. All eyes needing a 0.25 C. have not necessarily $\frac{2.0}{3.0}$ V. Some exhibit only V. $\frac{2.0}{4.0}$, and yet this weak cylinder will enable them to see clearly the 20 line at 20 feet. This is curiously shown in eyes of the same individual which differ in visual acuteness. One eye may measure $\frac{2.0}{3.0}$ and the other only $\frac{2.0}{4.0}$ and yet each is made $\frac{2.0}{2.0}$ by the 0.25 cylinder. In another series of cases one eye will exhibit with all lines sharp, the other $\frac{2.0}{3.0}$ with one series of lines more distinct. The 0.25 C. will bring the dull eye sharply up to the normal, and the same glass will brighten up the whole picture when placed before the eye which without comatropia indicated no astigmatism. Should the cylinders be reversed, however, in the good eye the irregularity in the blackness of the lines would at once show itself, in evidence that the small degree of fault was being concealed by the eye muscles. It would come out, in spite of muscular effort to the contrary, when the fault was doubled by the wrong position of the cylinder.

I daily see persons who, in giving their history, can fix the time from which their head and eye discomforts started. Up to a certain period they had used their eyes with comfort. Then came a sudden demand for closer application and with it the trouble commenced. As the astigmatism is usually a congenital fault, it must have always existed, therefore, notwithstanding the astigmatism, the eyes had been comfortably used in moderation. We also often find that when some extra work had increased the eye strain and made the headache, the rest given by the temporary wearing of a cylinder would in time enable the astigmatic eye to do without the spectacle provided no unusual eye effort be again made. With young people it is no uncommon occurrence to find cylinders discarded at the end of school life, at least by those with whom the demands of society allow no time for close eye work.

We consider the shape of the eye ball as much a feature to be inherited as the shape of the ear, nose or mouth, with this important difference, that whether the nose is pointed or stumped we can smell with it equally well, but should any deviation occur from the typical shape of the eye

ball, interference with vision is the consequence. These deviations in the eye shape are the rule. A perfectly formed eye in these days is as much an exception to the typical shape as a beautiful face is to the average citizen. Hence it is that I find astigmatism extremely common. With those who must apply themselves to close work, it is the common cause of head discomforts, which can only be relieved by rest, and this class can not afford it, or by the wearing of cylinders, which is now within the reach of everyone.

We often find a patient prompt in accepting or rejecting one of two cylinders that differ in strength a 0.25 D. There are some ophthalmic surgeons who will permit an eye to vary from a 0.5 to 0.75 and know that they are giving an immense degree of comfort to their patients by recognizing this difference. These very surgeons repudiate the ability of an eye to determine between a 0.5 and 0.25. The eye accepts the 0.25 C. but the surgeons have drawn the line of the 0.5 C., and avow they will never prescribe a glass that is weaker. The result is that some one else will have to do it. I find myself applied to by persons coming from other specialists with the 0.5 D.C. with head discomforts unrelieved, who secure freedom from headache and the ability to use their eyes with comfort when the cylinder has been reduced to 0.25. I so often find the use of a 0.25 D.C. making the difference to the wearer of from not being able to read a few minutes without headache to reading for hours with no headache, that I expect to secure these good results in prescribing them.

Another very common experience with me is that persons who suffer with persistent headache and hardly remember the day that they have been free from it, secure relief from the day that the 0.25 D.C. was first put on.

In the last four years I have been using the 0.25 D.C. more and more frequently. To give some idea of the number of 0.25 D.C. which I prescribe I find that last year alone I gave them to over three hundred private patients, and in hospital practice to fully as many more, so that in one year over six hundred pairs of 0.25 C. have been prescribed through myself alone. The uninitiated would say that in many of these cases the glasses must have amounted to nothing. That suggestion is promptly met by this counter-statement, all of these persons, mostly young students, bookkeepers or sewing girls, suffered more or less severely with headache and eye pains on eye use and they had applied for special treatment with the hope of getting rid of their annoyance. As with them all close application was a necessity, they all suffered from their daily work.

In all of these a small degree of astigmatism was found, which a 0.25 C. D. completely corrected. The fault was most frequently in the horizontal meridian, next in frequency in the

vertical and least frequently in the oblique diameters of the cornea. As a rule the annoyances were greatest when the faulty corneal curvatures were obliquely placed. The 0.25 C. gave the relief sought, in by far the majority of these cases. In many of these persons whose history could be traced, perfect relief continued with the use of these weak cylinders.

I have formulated for myself in office work this order. When a young person with no eye congestion who has $\frac{2}{5}0$ vision and reads readily No. 1 of the test types, complains of pain in eyes and head on use, so convinced am I that astigmatism is at the bottom of the trouble that I seek it at once, in the very beginning of the eye examination. If it had not been found by others it is not because it did not exist, but because it had not been diligently sought. That a great many of these patients would exhibit heterophoria from the fixed standard of muscular strength, I am quite convinced. I find in by far the majority of cases with the correction of the astigmatism all evidence of muscle straining passes off, and in such patients the heterophoria does not call for recognition, because it no longer annoys when the cylinders are worn.

The least degrees of astigmatism cause in the world the greatest amount of head and eye discomfort, and the 0.25 C. will correct these refractive errors and will relieve head and eye pains. I not only therefore say that the weak cylinder ought to be prescribed, but that the ophthalmic surgeon is remiss who does not seek, find, and correct these small but annoying errors in corneal curvature.

DISCUSSION.

DR. J. L. THOMPSON spoke of a case in which 0.25 D. gave relief when 0.50 D. did not.

DR. F. C. HORTZ said he often finds cases of a low degree where cylinders do not relieve the asthenopia. In these cases the asthenopia is due to heterophonia.

DR. T. E. MURRELL called attention to an unaccountable condition frequently observed by him, viz.: two eyes having an equal degree of astigmatism but with very unlike vision uncorrected, one being sometimes doubly as acute as the other, but both having equal vision with the same correcting glass.

DR. GEORGE T. STEVENS: There appears to be no difference of opinion in respect to the correction of practical degrees of astigmatism. The question is, what constitutes a practical degree of astigmatism? The judgement of the surgeon must determine whether an amount of astigmatism bordering upon perfect or practically perfect refraction is to be regarded as an amount which will require the use of glasses which by their mechanical objections are irksome to the patient.

The physical condition of the patient, the form of astigmatism, and various conditions must guide us in determining the prosperity of a constant correction of vary minute degrees of astigmatism.

DR. BURNETT, of Washington, said the normal astigmatism was at least 0.25, but that undoubtedly the wearing of a 0.25 cylinder would often give relief to asthenopic symptoms. In these cases he thought the astigmatism was somewhere between 0.25 and 0.5. He was interested in the statement of Dr. Chisholm that version had in one instance been advanced from $\frac{2}{5}0$ to $\frac{2}{2}0$ by means of a 0.25 cylinder. He could not consider it as physically possible. There must have been some mental astigmatism.

MONOCULAR DIPLOPIA.

Read in the Section on Ophthalmology, at the Forty-Second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY I. H. THOMPSON, M.D.,
OF KANSAS CITY, MO.

The relation between the eye and brain has always been a fascinating subject for study, and as would be naturally expected, the school of ophthalmology has done very much to aid in the determination of the characters, symptoms and localization of cerebral troubles. The invention of the ophthalmoscope antedates but a short time the development of the cerebral surgeon, and although this instrument enables us to almost see the brain, it can only yet be considered an aid to diagnosis, for the knowledge we have of cerebral morphology is the result of the patient study of many minds and the sifted records of ten thousand cases. Every addition to the common fund of experience may be of value to all, so I feel that I am justified to introduce the subject diplopia monocularis, with a report of a case from my own practice, and review some cases from the writings of others. They are few and scattered, but they all refer to monocular diplopia dependent upon intracranial disturbances, and in no way the result of interocular disease or refractive error. My purpose in the preparation of this paper is to speculate on the cause of this remarkable symptom, and to try and find why it has been put down by certain chirurgical authorities as one of the signs of brain tumor. Whether monocular diplopia is a common occurrence or not, I am unable to say. My own experience is limited, but the fact that so little has been written about it by ophthalmic surgeons, leads me to believe that, as a symptom of nervous disease, it is rare or often overlooked. The following case is remarkable and of more than common interest:

Miss T., a healthy, moderately robust lady, 35 years old, was injured in a railroad accident on the 25th of July, 1890. She was sitting in a

chair car when the train, which was moving very rapidly, left the rails. The car turned half over and was thrown against an embankment. Although she was expecting to be hurt, and for that reason held fast to her chair, she was thrown completely down the car into the opposite corner. She was for the moment stunned, but rapidly recovered and, assisted by the porter, left the car. She received a slight cut over the left fronto-temporal region; she had no other wounds of the head, so after the bleeding stopped she walked around, attended to herself and conversed with the passengers. She took a relief train home, and went to bed. The next day she was sore from the bruises she had received, and found that she had a fracture of the coccyx. Because of the tenderness of the spine and sacrum she remained in bed four months; she was then able to sit up some little, and on several occasions went down town. On one of these trips she visited me. She complained of diplopia, which had lately come on, and which so annoyed her that she could not walk steadily or use the eyes at very close work, unless she bandaged one with a handkerchief.

I examined her eyes and found them slightly astigmatic. With each eye tested separately, and aided by the correcting cylinder, vision was normal; she had pronounced homonymous diplopia—the flame seen by the left eye was to the left and above the one seen by the right; the two flames could be brought on the vertical line by moving the candle to the right, but they could not be united without prisms. Pupil reaction normal, no color blindness. On pressure, the scar of the wound of the head was tender; no other symptom whatever of cerebral irritation. The diagnosis was simple myopic astigmatism $\frac{1}{2}$ dioptré; paresis of the left external rectus and left inferior rectus, probably dependent upon injury of the head or spine. I saw her twice, and recorded no change in the condition.

In the meantime she entered suit against the railroad company for damages. I was summoned by her to testify, but refused to go into court as an expert without an extra examination.

At this examination I recorded monocular diplopia, and although I was suspicious, still, after a most careful trial with prisms, I was compelled to admit that she had not only homonymous diplopia, but also diplopia in each eye. When, in a darkened room, she looked at a lighted candle, she saw four distinct flames, and if a prism, base downwards, was moved before one eye, the moment the apex entered the pupil area she saw six flames. The same phenomenon was observed when the other eye was armed with a prism. In each eye tested separately she was double. In an endeavor to measure the parietic deviation, I was embarrassed by the inability of the patient to define the relative positions of the flames, which was further augmented by the fatigue the trial

occasioned. There was a strong probability that the insufficiency of the left external rectus and superior rectus still existed in its original degree. Regarding the monocular diplopia I made the following note: Left eye examined, right covered, dark room, lighted candle at 20 feet, diplopia, flames diagonally opposite each other about 18 inches apart. Each light was equally distinct. A black dot on a piece of white paper, at reading distance, was seen double, diagonal diplopia; a black pencil 4 inches long, held vertical before the eye at 16 inches, was seen double, lateral displacement; held horizontal, double, horizontal displacement. When the pencil was tilted from the vertical to the right, the two objects approached, and at 45° —degree calculated as in fitting cylinders—the pencils were united, the patient described the picture as one pencil covering the other, the inner being nearest to her and projecting somewhat over the other. Beyond the diplopia and appreciable contraction of the visual field, the eye was normal, vision with cylinder -0.5 $180^\circ \frac{2}{0}$. The right eye was examined in the same manner, the same diplopia, four lights, with the edge of the prism dividing the pupil; the same angle and relative distance of displacement. When this eye was examined with the pencil the same phenomena were observed as in the left, at exactly 45° the pencils united. When first tested, this eye had normal vision, but at the last examination vision had dropped to $\frac{2}{20}$, with the visual field very much contracted. Pupil reaction normal, no appreciable disease of the fundus. Suspecting that there may have been some organic lesion of the brain to account for such symptoms, I carefully sought for the different kinds of aphasia, word-blindness, etc., but could find no apparent disease whatever.

To my mind this was a case of hysteria, that the paresis of the recti muscles was of the character named by the French *hystero-traumatique*, and the monocular diplopia was the immediate result of autosuggestion. I so stated on the stand. Of course there is a possibility that the binocular diplopia first complained of referred in some way to functional derangement of the nerve centres. It certainly was not the result of nuclear paralysis, and a cortical lesion as the determining cause may with equal certainty be discarded. There are many reasons to believe that this symptom is in the majority of cases hysterical. To support my opinion, I beg leave to present a translation of a similar case reported by Brunschwig in the *Recueil d'Ophthalmologie*, August, 1889:

Leonie L., age 11 years, had for six years a converging squint of the right eye; had never had disease of the eyes. Suffered at 10 years of age from an attack of typhoid fever. We first saw the patient on the 3d of August, 1889, when we were asked to straighten the eyes. By oblique illumination and through a lens we could see that

there were two small nebulous deposits in the cornea, tending to a V-shape, but the ends were not united. The iris was normal, no ophthalmoscopic lesion. Both eyes were hypermetropic 3 dioptics, also some astigmatism, but correction of the refraction did not very much improve the vision. Good perception of color by both eyes. The visual field is notably contracted, especially that of the right eye, whether tested by white or colored objects. An object viewed by the right eye is seen double; when a rod of red sealing-wax was held vertical before the eye at 1 metre distance, the patient saw two rods, lateral displacement about 5 centimetres and parallel. At 4 metres the objects were double and parallel, the two rods remaining about the same distance apart whatever distance they were away. If the rod was placed horizontal before the eye, it was seen double, vertical displacement, parallel and 5 centimetres distant. In whatever position the rod was held before the eye, it was seen double. The correction of the hypermetropia and the astigmatism had no effect on the diplopia, nor on the distance between the two images. A prism 10° placed horizontal before the right eye, the left being closed, gave a picture of four objects when the base divided the pupil area. The rod viewed with both eyes is seen triple, which lasts but a moment, for the squinting eye immediately returns to its false position. A stereoscopic examination did not in any way change the result, but when the patient viewed an object through a boise-de-Flees, it was found that the diplopia could be transferred to the left eye, if the patient believed the trial only referred to the vision of the right.

The author, in commenting upon this case, speaks decidedly in favor of an hysterical hypothesis, for, as he very properly remarks, what abnormal condition of the brain could bring about such a train of symptoms without other evidences of organic disease? Of course the last test and proof of simulation, made by the examination with the boise-de-Flees, was conclusive, and fixed decidedly the nervous nature of the complaint. In the light of our present knowledge of the hypnotic influence, we are prepared to believe that many more strange and remarkable perversions of the intellect are possible than have heretofore been supposed, and for convenience we place them all under the symptomatology of hysteria. We know that in certain mental conditions the phenomenon autosuggestion is easily excited, and is it not probable that its relation to the simple reflex movements is closer than neurologists are prepared to admit?

This may in a measure account for that peculiar symptom, monocular diplopia, which in the cases above referred to, was so prominent. In the child we had the squint, and therefore supposed diplopia, which was immediately referred

or transferred to the right eye when, in an endeavor to measure the refraction of that eye, the attention was directed to the right visual field.

There are several circumstances which lead me to think that a like cause had a similar effect in my own case. The primary parietic squint and its necessary diplopia excited in a disturbed brain, an impression which culminated in a true visual hallucination.

I find several similar cases reported, two by Hayfelder in 1849. Both subjects were watch-makers; they recovered. Notice! That watch-makers learn to suppress the usual field of one eye; when working with a lens the near point is brought within the range of convergence.

Foutan, in 1885, reported to the Ophthalmological Congress the case of a boy 14 years old, a subject of monocular diplopia without ocular disease, but a true neurotic. Foutan, in commenting upon this case, suggests the following, which Brunschwig publishes, but questions: "The image formed on the macula is received normally by the nerve which divides at the chiasma, so that two similar impressions are conveyed to the corpora quadrigemina, or implanted on the visual centres at the cortex. Ordinarily the two pictures are united by a cerebral act or sympathy, which exists between the functions of the two brains. If, however, the joining of the two pictures does not immediately take place diplopia is the result." Should, because of functional disease or interference with the normal conduction of impulses or nerve discharges along certain established paths throughout and between the hemispheres, the personal equation of either brain be shortened or prolonged, there can arise a condition about the visual centre at the cortex analogous to parietic squint, or what the otologists call diplakousis. Therefore, I am inclined to the opinion that there is more in Foutan's theory than is commonly believed, and that in such cases the trouble lies in a lack of harmony between the two visual centres.

James E. Adams reported to the London Ophthalmological Society a case of monocular diplopia. A woman injured in a wreck, suffered from converging stabismus and monocular double vision which lasted several weeks. The trouble was referred to the right eye, in which there was no disease of the cornea or media. She received damages and then rapidly recovered; diagnosis, hysteria. Dr. Ord, *St. Thomas Hospital Reports*, 1879, case of boy 13 years old. An epileptic, could find nothing abnormal in the eye or brain.

In the opening paragraph of the report of a case of monocular diplopia, published by Sucamis in *Zahenders' Monatsblatter fur Augenheilkunde*, July, 1890, the author states that the diplopia has been recognized as one of the symptoms of

intercranial tumor. This is undoubtedly true, but after a careful perusal of the literature of brain lesions I am able to find but very few well authenticated examples, and they principally in recent publications. The most instructive case is one reported by Dr. Shaw, of St. Louis, in the *Kansas City Medical Record*: Chas. Green, a Scotchman, laborer, good family history, of sober habits; received a blow from a crowbar on the head eight years ago which rendered him unconscious for some time. He remained well until the summer of 1890, when he was attacked with vertigo and severe pain in the head. The headache became constant; he then developed symptoms of tumor of the brain, in staggering gait, vertigo, straddling walk, pain in the head, deafness of the left ear, right homonymous hemiopia and diplopia of the left eye, double optic neuritis, vomiting and epileptic attacks. The left ear began to discharge a short time before he was admitted to the hospital, but before that he had had a lump behind the ear which had been lanced twice. He never had earache. He died. The author, in reviewing the symptoms, had no doubt but that he had a case of brain tumor. The symptoms suggested either tumor or abscess; but the lack of fever, sweating, and evidence of inflaming before the ear discharged, rather excluded a probability of cerebral abscess and confirmed the opinions expressed. By an ingenious reasoning Shaw located a tumor in the cerebellum, immediately under the tentorium, probably pressing against the occipital lobe. Being anxious to complete the report of the case, I received of Dr. Dalton a copy of the Records of the City Hospital of St. Louis:

"Charlie Green was admitted to this institution Oct. 3, 1889, and died April 18, 1890. From him we learned that his family history was good so far as he knew. His father and mother died when he was quite young. He himself had never been seriously sick, but at one time or another he had all of his limbs broken. He was never addicted to drink. For some months before admission to the hospital, he had shooting pains in his head in the morning while lying down, but had no trouble when walking about. He has had, and has now an eruption on his hands, face, forehead, shoulder, and anterior portion of the thorax. It began on his chin, and had existed about one year. No history of syphilis could be made out. November 4, he informed us, for the first time, that he had received a blow on the top of his head eight years before; he was unconscious for awhile, after which he had no trouble. Four months before admission to the hospital he first noticed the present trouble. While working one day he suddenly became dizzy and remained so for ten or fifteen minutes; this was followed by terrible

pain in the head, mostly at the base of the brain and about the occiput; pain remained several hours and then disappeared. The next day he had a similar attack; the attacks have been quite frequent since that time. The first sensation was a rush of blood to the head, then dizziness followed by severe pain, sometimes shooting in character, at other times dull. The attacks would usually last about two hours, and come on four or five times a week. He never became unconscious or delirious. During the last three months he has been very restless at night; talked a great deal in his sleep. His business had been that of a moulder, which he had to give up, because he was unable to stoop without causing a return of the headache. On October 10, a week after admission to the hospital, he was found standing in the watercloset in an unconscious condition, looking wildly around. He was gotten to bed with great difficulty, where he lay muttering and holding his hands to the side of his head. Pupils dilated; too restless to determine their reaction; heart active, though weak and irregular; face and lips pale. After a few hours returned to consciousness; stupid headache very severe; pulse weak; urine normal.

November 5. Patient complains of the pain in the head, especially at the base of the brain; this condition now remains almost constant. Attempts to wander around the wards in an aimless manner, with difficulty kept in bed. Was given large doses of the iodide of potash, without benefit. On January 6 a few epileptic attacks were noted, and these were preceded and followed by severe headache, which would always begin in the posterior and lower portion of the head, and soon pass over the entire skull. This was accompanied by dizziness. He always fell on his left side, and in walking during these attacks he always walked to the left. Hearing in the left ear defective, left eye amblyopic. He sees double with this eye always, sometimes also with the right eye. He has right hemianopsia, sometimes the entire field is narrowed. On the 2d of March he had a severe fit, followed by intense headache; this condition continued about the same until April 8, when he died in a convulsion.

The post-mortem examination showed all the organs normal except the brain. On opening the calvarium a large quantity of cerebro-spinal fluid escaped. In the right lobe of the cerebellum was found a cyst holding perhaps half an ounce of fluid, and a tumor about the size of a small lemon. The growth extended up into the right peduncle."

Another very interesting and well prepared case is reported by Dr. Tilley, of Chicago, in the *American Journal of Ophthalmology*, January, 1888:

"Mary R., 9 years old, orphan, was presented to Dr. Tilley suffering from a peculiar train of symptoms. Her face had the appearance of her

being in great distress, and she held her head as if she was afraid of jarring it; spasmodic ptosis; she complained of some infra-orbital pain, which was increased by pressure; she also had pain on lateral movements of the eyes, so that she moved the head in looking sideways. There was no paralysis or paresis of any of the muscles. She suffered from headache which came on every day. No malaria. Conjunctiva slightly congested, lids, cornea, lens, vitreous and retina normal. Vision $\frac{6}{18}$, pupils normal and reaction normal. She complained of double vision in the left eye. A probe held vertical before her was seen double, horizontal displacement; held horizontal, double, vertical displacement. A most careful examination to detect fraud, convinced the doctor that her statements were true. At all parts of the visual field diplopia was present, the distance between the two images corresponded with the distance the object was from the eye. The sign of the interocular angle increased as the visual line was lengthened—at 1 metre the displacement at the retina was .074 millimetre, at 6 metres about .456 millimetre. Paralysis of the accommodation by atropia made little difference in the subjective phenomena, but the secondary image appeared nearer. The patient was completely red-blind. These observations were made during November and December, 1887. On the 13th of December, the girl had symptoms of cerebral disease; vomiting, delirium, etc. The child improved. Dr. Tilley visited his case in January, 1888, and found her suffering from abscesses all over the body, which inclined him to believe that at one time there had been an abscess of the cerebrum encroaching upon the lateral ventricle."

John Abercrombie, in 1881, reported a case of a girl suffering from headache, vomiting, peculiarities of speech, paralysis of the right side, with paralysis of the right external rectus. She had double monocular diplopia. On post-mortem examination, found a large abscess in the left occipital lobe and rupture into the ventricle.

The three above cases are well-marked examples of diplopia monocularis dependent upon intracranial disease. In Abercrombie's case we find an abscess of the right occipito-temporal lobe. Of course the extensive disease of the brain substance and membranes, together with the ventricular empyema, was undoubtedly the cause of death, but this was the sequence of an inflammation starting in the occipital lobe which affected (not involved) the right cuneus and optic tract, by pressure or irritation. Although it is extremely difficult to determine the relation between cause and effect, the paralysis of the external rectus depended upon an inflammation at the base involving the sixth nerve in its course, and not nuclear. It may be asked, if this reasoning is correct, why was there now left homonymous hemiopia? I think the seat of the abscess was

too far from the cuneus to immediately destroy that visual centre, but sufficiently near to embarrass it. In the Tilley case, the author was inclined to locate the trouble near the third ventricle, but he candidly admits his inability to explain the sequence from cause to effect. The symptoms were unquestionably cerebral, and probably the cause was an abscess deep in the substance of the left occipital lobe.

The Shaw case is both interesting and instructive. The diplopia monocularis was one of the principal symptoms. That there was direct pressure and disturbance of the visual centres is demonstrated by the post-mortem. A tumor of the right cerebellum, of the character and size found in the autopsy, could hardly exist without distending the tentorium and pushing aside the posterior convolutions of the occipital lobes. Although I can understand the sequence of symptoms in this case, I can hardly explain the right hemiopia unless there is a mistake in terms. The choked discs could account for the narrowing of the visual fields, but not the hemiopia. It is evident, therefore, that the lesion was at the visual centres, and inasmuch as the diplopia could not have been recognized if the object was focused on the blind area of the retina, the irritation or cause of the phenomenon must have been at the visual centre least affected by the disease, viz.: the left cuneus. I have grave doubts if the so-called papili can occur unless there is some obstruction about the venous sinuses. Putting aside Seber's theory of the inflammation of the nerve caused by the presence in the vaginal sheath of irritating material, it is hard to explain the hypertrusion of the arachnoid fluids without admitting the probability of venous obstruction. Therefore, I am led to think that a lumen in the cerebellum large enough to interfere with the return of blood through the lateral sinuses, could very well paralyze by pressure the terminal occipital convolution, and involve the cuneus. This may explain the relative rareness of monocular diplopia. Hemiopia from tumor or abscess in the occipital lobes is common, associated with choked disc and amblyopia, when the diplopic symptom, which under different circumstances would be apparent, is marked. I think that monocular diplopia more often exists, but is overlooked. In nearly all, at least the majority, of the cases reported, this symptom was seen in connection with paralysis of the sixth nerve, a peculiar and remarkable coincidence. It is hardly reasonable to suppose that an individual suffering from extensive tumor or abscess of the brain would be in a condition to notice a visual peculiarity of this kind, unless by chance the attention was stimulated by an extraordinary examination. The history of the cases at our disposal, those reported by Shaw, Tilley, Abercrombie and others, is an evidence that double vision, confined to

ne eye, is not so rare as has heretofore been supposed. My conclusions are:

1. Diplopia monocularis is, in the majority of cases, one of the symptoms of hysteria, provided there are no physical conditions in the eye which can cause an object to be focused on two spots of the retina at the same time.

2. Diplopia monocularis in connection with recent or old squint, paralytic, hysterical or otherwise, is a symptom of a psychical condition, closely related to hysteria, in which the phenomenon, autosuggestion, is easily excited.

3. Diplopia monocularis not dependent upon disease or abnormality in the eye, but in connection with other symptoms of intracranial trouble, especially choked disc, hemiopia, paralysis, particularly when the train of symptoms points to tumor or abscess, is strong evidence that the lesion is situated in or about the posterior convolution of the occipital lobes.

AN EXAMINATION OF VON GRAEFE'S DOCTRINE OF "ANTIPATHY TO SINGLE VISION."

Read in the Section of Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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In Von Graefe's classical description of the condition to which he applies the term "Antipathy to Single Vision," he says: "It has sometimes happened to me that after squint operations with apparently correctly adjusted visual axes there have resulted double images only slightly removed from each other. The visual power of each eye has been quite good; alternating strabismus having previously existed, and the accommodative power has been similar in the two eyes. Nevertheless it has been in no way possible to bring about single vision."

He states that this condition of double seeing persists notwithstanding the interposition of prisms in various positions, and that every effort of the patient to unite the images results only in removing them to still greater distances.

He adds: "The tendency appears to be a direct physiological contradiction; for while in sound eyes some approach, especially in case of large retinal pictures, is sufficient to induce arbitrary muscular contraction in the interest of single vision, in these cases, on the other hand, it is found that exactly the opposite condition prevails, there being an absolute incompatibility to single vision."¹

In a still later article² he describes the condition more at length, pointing out the fact that the double images, although not far removed,

pass from one side to the other, above and below, or one behind the other, always on the point of uniting, but never united. Von Graefe explains the anomaly on the theory, first, of injury to the nervous centres of faulty projection from the retinae, and, second, of the supposed difficulty of obtaining regular associated action between muscles which have long been unaccustomed to association.

A careful examination of many of these cases of "antipathy to single vision" leads me to conclusions different from those arrived at by Von Graefe, and the practical application of these conclusions has shown that they are, at least in a great measure, correct. That, in a proportion of these cases, the technical details of disturbing elements may elude our search is undoubtedly true, but that the principles which I shall present will apply very generally I am fully convinced.

In a paper read before the American Medical Association, June, 1889,³ I have already expressed my disbelief in the generally accepted view of the existence of a physiological antipathy to single vision, and my conviction that, by properly selected and properly executed proceedings, this unpleasant condition may usually be eliminated.

The view of the causation of this anomaly, as set forth in that paper, may be briefly condensed into a single sentence.

The condition of antipathy to single vision as described by Graefe and by subsequent authors depends not upon lesion of the brain or faulty projection of the images from the retinae, but upon unequal tension of corresponding ocular muscles under the influence of corresponding nerve impulses directed to them.

I do not assert that no irregularity in projection from the retinae can occur, nor that cerebral lesions may not induce incorrigible diplopia. Such cases, if found, will present other and more definite phenomena of the existing ocular or central nervous disease than simply the presence of diplopia. The proposition refers to the cases which come fairly within the class so clearly described and so sharply defined by Graefe.

Excluding then, cases of paresis, and confining ourselves to the class of cases thus defined, we shall find the causation of this supposed antipathy mainly in two conditions. The first of these is acquired as the result of the squint operation or operations. It consists in the fact that by unequal settings back of the insertion of the corresponding tendons, there are induced irregular responses to the impulses directed to these corresponding muscles. In the examination of a very large number of cases, I have found this condition, but generally modified by a second to be mentioned presently, by far the most preva-

¹ Arch. für Ophthalmologie, i, 1, 118.

² Arch. für Ophthalmologie, iii., 1, 119.

³ Published in Archives of Ophthalmology, vol. xviii., p. 371.

lent. There will be found in such cases either an excessive rotating power, or a power of rotation only moderately restricted, of the muscle of one eye, internal or external rectus, while the rotating power of its direct associate of the other eye is materially restricted. As a consequence of this irregular and unequally balanced condition of opposing muscles no harmonious adjustments can be made, and the more earnestly the patient strives to bring about associated action, the more signally he fails.

That "settings back" of the ocular muscles to an unequal extent may be made with propriety and with success, was taught by the great master, Von Graefe, himself, and the practice has been very generally continued to the present time.

It is true that Von Graefe advised in extreme cases a division of the operation between the two eyes, but in fact, this was a concession only to most obvious disabilities involved in the failure of the most conspicuously associated movements toward the side opposite the eye operated on, if in a case of converging strabismus, and an impediment to even approximate convergence at near points. Within the limits of extreme results a full correction of the appearance of squint was, according to his teaching, not only permissible but desirable. This proceeding of making a correction of squint by a single operation has been supposed to be sustained by the theory that the muscle of the squinting eye is pathologically shortened to a considerably greater extent than its antagonist.

It may be conceded that there is, within certain limits of unequal tensions of accordant muscles, a possibility of union of images; otherwise binocular vision would in no case be established except when exact balancing of the tension is secured. That easy and permanent associated action is compatible with any considerable degree of diversity of tension, I do not believe.

It may be objected that if this proposition is correct the proportion of perfect corrections for squint by the prevailing methods of operating must be less than is ordinarily supposed. It is probable that examinations made by methods more exact than those which have been ordinarily employed would show that a very large proportion of cases in which binocular vision has been presumed to have been established by the ordinary squint operation is much smaller than is commonly supposed. However this may be, whether the results of the standard squint operation is often successful or not, it is certain that such unequal tensions are in many instances incompatible with a blending of the images.

A second causative influence, and one which acts as an element in nearly all of these cases, is

the difference in relative tension of muscles which act in the vertical direction.

The instinct of bringing images to the same horizontal plane appears to be very great and only second, if indeed it is second, to that of union of images. In case of double images, whatever the difficulty of blending may be, the patient instinctively exerts his best endeavors to place the images in the same horizontal plane. It thus happens, that in certain cases in which, either with or without slight lateral inequality of tension, the effort to bring images to the same plane induces a lateral squint,—a squint which may be variable; that is, such a squint may at one period of life be converging, and at another diverging. Thus, in a case now under my observation, the patient was, during her childhood, subject to a very pronounced converging squint. During the past twenty years she has had conspicuous diverging squint, although no opera-

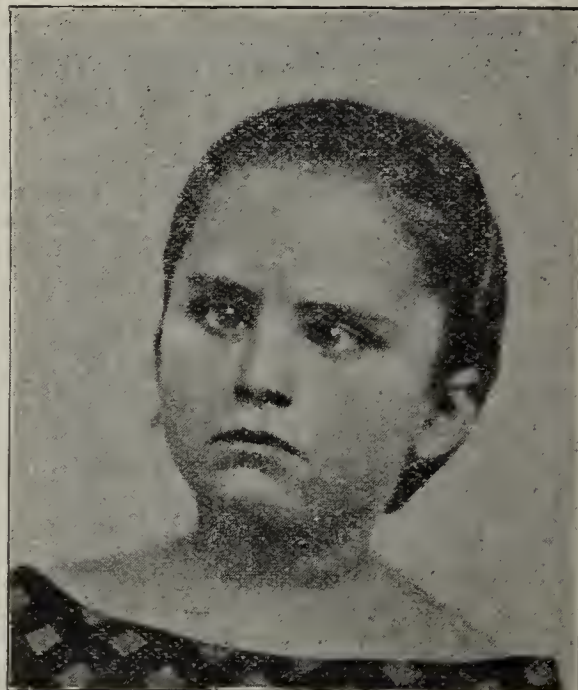


FIGURE 1.

tion has been made. Such a condition may properly be called *variable strabismus*, its character of divergence or convergence changing from time to time, remaining possibly in one direction during several years, then changing to the opposite direction.

If in such a case one or both interni or externi are cut, double vision of an intractable form is likely to result. In such cases we must make diligent search for the vertical deviation, a condition often obscure or not at all manifest, before we can succeed in establishing binocular vision.

I have had the good fortune to obtain a daguerreotype portrait of the lady whose case has just been mentioned, taken during her childhood, and from which I have made an enlarged photograph which I have the pleasure of show-

ing (Fig. 1). The photograph shows converging squint, so pronounced that few ophthalmic surgeons even at the present day would hesitate in regarding it as a proper case for a free division of the internus of one, if not of both eyes. Had such an operation been performed upon this patient in early life, intractable diplopia would doubtless have resulted, and eventually extreme diverging strabismus. In another photographic portrait of this lady, made by myself a year ago (Fig. 2), a moderate appearance of diverg-



FIGURE 2.

ing strabismus is seen. In fact a divergence of more than 12° with corresponding crossed diplopia existed. But the most striking feature suggested by this photograph is the left hypertropia, well defined in the position of the eyes and of the brows. The question at once arises whether the change from converging to diverging strabismus is not the result of some radical change in the static condition of the eye-muscles. That this is not the case will be seen by the most cursory glance at the third portrait (Fig. 3), in which the old converging squint has returned. This condition of convergence can be induced at

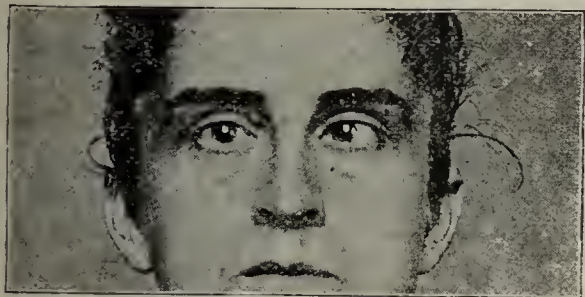


FIGURE 3.

any time by the application of a solution of atropine to the eyes. At the time of taking this third portrait, atropine had been applied twice a day for three successive days, and its effects were complete. A week after that time the diverging squint had returned and has continued during the year. The transformation from divergence to convergence occurs within an hour after the first application of the atropine, and the present habitual condition of divergence returns as soon as the effect of the drug passes off. This variability is, without doubt, due to the action of the muscles in the effort to overcome the unequal height of the images, and until the condi-

tion of the hypertropia is eliminated such changes of the lateral relations are liable to occur. In passing, a single thought may be given to the adverse testimony of such cases to the well-known doctrine of the relations between the excessive efforts at accommodation and converging strabismus; for here the converging strabismus occurs only when accommodation is neutralized. The present interest in the case centres in the fact that had a free tenotomy of an internus been practiced during childhood, the almost certain result would have been an "antipathy to single vision." Even at the present time, when the conditions of hyperphoria and hypertropia are carefully sought for, this patient is able, under many circumstances, to conceal completely the evidence of hyperphoria as shown by the phorometer.



FIGURE 5.

A curious fact in connection with the inequality of tension of the lateral muscles associated with hyperphoria is, that a condition which in a passive state of the muscles of either eye or of both eyes is a marked divergence, becomes, as soon as all the muscles are engaged in the act of adjustment, pronounced convergence attended by homonymous diplopia. Conversely a like change may occur when the tendency is, in the passive state, to converge.

A very practical illustration of what has been stated may be found in an actual history which I condense for this purpose. In a child with left hyperphoria (or hypertropia) the left eye drifted outward during the first few years of life. (Such a diverging squint is rarely observed by parents unless it is extreme.) At length, presumably as the result of a change in the methods of making the efforts to adjust for the horizontal plane, the squint became convergent. The ap-

pearance of the eyes of this patient in early childhood is represented in Fig. 4, which is copied and enlarged from a daguerreotype picture of him taken at the age of about three years.

About three or four years later, and after the divergence had given place to convergence, a surgeon performed tenotomies of the two recti interni, presumably severing both tendons completely. The result proving an over-correction, the effect of the operation on one eye was modified by the insertion of a (conjunctival?) suture. The result, in view of what has been stated above, was such as we might anticipate. Double vision of the most annoying character was always present. The efforts of many distinguished surgeons to induce these twin images to unite by means of prisms, even for an instant, were fruitless after trials repeated during many years. The case found a prominent place in ophthalmological literature, endorsed by several distinguished surgeons, as one of the class now under discussion. No case could therefore afford us a better model for our study.

It proved easier for this patient to fix objects with the left eye. That being the case, we may suppose that he would make a certain effort of adjustment with the weakened internus of that eye, which would be associated with a corresponding excessive effort of the opposite internus. But these unequal efforts would also be combined with the effort to adjust for the difference in the positions of the images with reference to the horizontal plane. The result would be an excessive rotation of the right eye to the nasal side with homonymous double images. If, on the other hand, a patient with this combination of defects should look at an object which is isolated from other objects which may serve to aid the disabled eye in active adjustment, as, for instance, at a church spire, or at the moon, or a bright star, in which cases only the clear sky is in immediate relation to the object, the most disabled eye would at once drift outward, and crossed diplopia would result. So also, if a small screen were to be interposed between either eye and the object looked at, thus shutting it out from active participation in the effort of adjustment, the covered eye would diverge in a marked manner and would move inward, perhaps to the extent of one third the diameter of the cornea, as soon as the screen should be removed, and then homonymous diplopia would be observed. Or again, if the subject of such a defect were to look through a grating, as, for instance, through the palings of a picket fence, an object seen beyond the fence would be seen doubled, and the diplopia would be crossed; while an object seen between the person and the fence would be double also, but the double images would be homonymous. In the first instance, looking beyond the fence, the adjusting energy of one eye becomes passive, as

in the case of looking at the object against the clear sky, with resulting crossed diplopia. In the other instance, looking at the object nearer than the fence, active adjustment of both eyes occurs with excessive convergence and homonymous double images. All these suppositions and conclusions have been fully justified in the actual treatment of these cases.

In certain cases in which this intractable diplopia exists, the patient has the extraordinary faculty of selecting at will which eye shall fix the object, and the diplopia becomes homonymous or crossed, according as the one or the other eye is engaged in direct fixation. Thus, in the case of a lady patient, if I direct her to look with the right eye, I can see that the eyes are strongly converged, and she reports the presence of homonymous double images. If I then direct her to look with the left eye, the change may require a few seconds or it may take place very quickly. Then the eyes are plainly seen to diverge, and the diplopia is crossed. In such a case, the nervous impulse directed to the right internus is greater than the normal during fixation with that eye, and when a corresponding impulse is sent to the left internus, the eye is caused to swing in excessively and too great convergence results. On the contrary, when the left eye is fixed, there is no such excess of nervous impulse sent to the left internus, and as no excessive impulse is therefore sent to the right internus, that eye swings outward passively, and crossing of images results. But in this explanation we must lose sight of the important, probably the most important, element in the causation of the inward swing in many if not in the majority of cases. This is the influence of the difference of tension of the muscles which move the eyes in the vertical direction. This influence is often sufficient, even though the moving power of the corresponding lateral muscles should be equal, to cause a swing beyond that which would result from a given impulse to a lateral muscle. I have rarely met with a case of the so-called "antipathy to single vision" in which this element did not play an important rôle.

It needs no argument to show that the defect which causes the patient to have homonymous diplopia when looking at an object, say at twenty feet distance, and heteronymous diplopia when looking at the same object, if a grating, like the fence of which we have spoken, is interposed between the eyes and the object, or which causes the same patient to have homonymous images when looking at an object surrounded by other objects, and crossed images when looking at an object isolated from visible surroundings, lies neither in the brain nor in faulty projection from the retinae, but in peculiar, although perhaps obscure, defects in the adjusting apparatus.

Homonymous diplopia caused by a brain de-

fect or a retinal defect would remain homonymous under all the circumstances which have just been mentioned. Activity or passivity of certain efforts of adjustment could and would be modified by the circumstances mentioned, and the phenomena resulting, which at first appear confused and irregular, are in reality uniform and in accordance with fixed laws.

It is not to be denied that the investigation of an individual case is often surrounded by immense difficulties, or that each new case may present new and perhaps at first incomprehensible phenomena. It is none the less true that all these cases will be found to be governed by known laws. If the difficulties of interpretation of the phenomena in individual cases are great, it demands the greater skill and patience on the part of the investigator in searching out all the various influences which combine to make the defect.

It would probably be impossible, even if all the facts were in our possession, to lay down distinct rules for the discovery of the exact nature of the faulty relations of muscular tension in each case of this class. To attempt it even to the extent to which the principle has been studied, would be to record separately the experience in each individual case. Enough has been said, however, to indicate the lines on which the investigation is to be made.

In the correction of the defect—this incompatibility to single seeing—we must logically seek to reestablish a degree of equilibrium between the mobilizing functions of the opposing muscles. To this end, after first correcting the unequal tendency in the vertical direction, it will, in most instances, be necessary to bring the insertion of the disabled muscle forward, and to reduce the tension of the corresponding one of the other eye. This procedure is by no means as easy as might appear. To readjust the tendon after such a setting back as occurs in the standard squint operation, requires in many instances the most persistent and skilful treatment.

Very little can be accomplished by a gross advancement, in which the already disabled muscle is made even less flexible than before. The object is secured by progressive steps, one slight advancement preparing the way for another, until the proper degree of rotation, with as great flexibility of the muscle as possible, is secured. Then the corresponding muscle of the other eye, if it has not been already relaxed, must be made to assume, as nearly as is required, a corresponding adjustment, by a careful relaxation.

Such a procedure has, in my hands, succeeded in establishing binocular vision in many inveterate cases of the so-called "antipathy to single vision." The process is often long and difficult, making the greatest possible demands upon the skill, courage and patience of the surgeon, and

the persistent and intelligent coöperation of the patient.

It has been my purpose to do no more than to indicate in a very general way the principle which I would advance, namely: that incompatibility to single seeing usually denotes incorrect methods of operating, and that there can be no effectual correction of strabismus which leaves the tension of the corresponding muscles of the two eyes unequal. The supposed success of many cases in which such inequality is caused by operation, doubtless results from the fact that in the remaining diplopia the images are so widely separated that the patient does not become aware of its existence.

In order to avoid the evil results of diplopia, and to secure not only possible but easy binocular vision, then, we must be guided, first, by the actual rotations of the eyes, and by the actual relations of the visual lines, not only in the lateral but in the vertical direction. This can be accomplished only when the patient recognizes the position of double pictures, and this according to the theory of identity. There should be no final operation for the adjustment of squinting eyes, until both patient and surgeon are sure of the relative position of the double images.

A precept which I have elsewhere brought forward is in this connection also of essential importance, viz.:

*"Every modification of the length of a lateral muscle, by relaxation or by shortening, which can in any degree affect the rotation of one eye, should in every instance be accompanied by an exactly equivalent modification of the corresponding muscle of the other eye."*⁴

If this precept is correct, the practice of relaxing or setting back of an internus, accompanied by an advancement or shortening of the externus of the same eye, while the muscles of the other eye undergo no modification, cannot afford the best results.

The subject of the determination of the relative tensions of the various eye muscles I have already discussed at some length, in a series of articles published in the *Archives of Ophthalmology* during the years 1887, 1888 and 1889. It is unnecessary to repeat what has there been said, but there is also much more which might be said in connection with the examination of the relative tensions in these peculiar and most difficult cases, which must be reserved for another occasion.

One point, however, is so important in its relation to the subject under consideration, that it should not be separated from it. This is the examination of the comparative rotation of the two eyes in the temporal and in the nasal direction. Something can be learned from an inspection of the movements of the eyes as the surgeon causes

⁴ Anomalies of the Ocular Muscles, Arch. of Ophthalmology, 1889, p. 407.

the patient to follow with the eyes a pencil or other object as it is carried from side to side, the patient making his best efforts to see it as far toward the extreme outer field of vision at each side as possible. It will in most of the cases, in which the original operation has been performed for converging strabismus, be seen that as the eye on which the operation, or the most extensive operation, has been performed, moves toward the nasal side, its progress is arrested before the border of the cornea reaches the inner canthus.

The nasal rotation of the other eye will often be found to be free, or even excessive. But even the nasal rotation of this other eye may be restricted, only in less degree than the first. Similarly, we may observe a difference in the temporal rotation. This method of inspection, while important and in some measure satisfactory, furnishes less exact information than is required in most cases.

In the measurement of the temporal rotation, we have in the perimeter an instrument of sufficient precision. It is my custom to place in the carrier of the perimeter a few capital letters in clear type, of about the size 2 = D. of the Snellen scale, and require the patient to see the letters with sufficient clearness to read them. A glass to meet the requirements of the patient's vision is held in such a way before the eyes, that it is at a right angle to the line between the eye and the test object. Ordinarily, a pair of eyes in which no considerable degree of heterophoria exists will make the temporal rotation about 40° each, and no considerable difference in this rotation should exist. In many of the cases under discussion, the temporal rotation will be found to differ for the two eyes to the extent of from 10 to 20°. With the new model of the registering perimeter, this element can be quickly and accurately determined.

Unfortunately, we have no method so accurate for examining the nasal rotation. The full rotation of the eye in this direction in the normal condition cannot usually be determined by the perimeter, except by the supplementary use of a strong prism. Even with this supplement, the extreme rotation inward of cases of slight converging squint cannot be registered by the instrument. In cases in which the rotation does not much exceed the line of vision across the bridge of the nose, we may place a rounded prism with its apex in the canthus. Two degrees of prism equal one degree of the perimeter. Hence a prism of 10°, apex in the canthus, may cause the eye to turn inward 5° more than it would in looking directly at the object. The expedient of placing a scale of degrees on the lower lid, and reading from it the nasal rotation, while inaccurate, is sometimes the only recourse, and the best use of an unsatisfactory method must be made.

DISCUSSION.

DR. J. H. THOMPSON said that he had found the operation for squint a very difficult one to gauge. He does not now believe it is so often due to hyperopia as Donders taught, often seeing it in emmetropia. Believes it to be due in many cases to congenital amblyopia. He thinks that after a squint operation with good vision in both eyes, if there is antipathy to single vision, the trouble is in the brain. When a muscle is set back, it often does not symmetrically reattach to the globe, and a want of coördinate action leads to divergent squint. He believes in cutting very little, and in advancing the weak muscle.

DR. EDWARD JACKSON had seen three cases falling under Dr. Stevens' classes. He thought in these cases there was some anatomical defect in the nerve centres, the squint dating from infancy, and there never having been fusion of images. In one case there was anisometropia and would fix differently with the two eyes, possibly lying in a defect in the commissures.

DR. STEVENS, in closing the discussion, called attention to the want of equality in height between the two eyes, one being generally on a different level from the other. He finds this in all cases where there is no other palpable cause. On correcting this difference in level, the adjustments become more and more perfect.

HÆMORRHAGIC GLAUCOMA WITH AN ANALYSIS OF THREE CASES.

Read in the Section of Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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By hæmorrhagic glaucoma I understand that form of glaucoma which is preceded by numerous hæmorrhages in the retina, and when in the majority of cases the glaucomatous symptoms do not show themselves for many weeks after the visible retinæ changes. It is hence a secondary glaucoma. The youngest case on record occurred at 35 years of age and is reported by V. Græfe. The disease occurs most frequently in persons who have passed the fiftieth year, and there is every reason to believe that the time of life is here an essential factor. The attacks generally commence with a sensation of pricking beneath the lids, as though a foreign body were lodged there. The lachrymation is considerable and there is much conjunctival injection. The pains radiate all around the eyeball, down the side of the nose and over the head frequently back to the occiput. We have, in other words, a most aggravated form of ciliary neuralgia.

In these features the disease does not differ from acute inflammatory glaucoma, though in my opinion, the attacks last longer, and even between the paroxysms—which by the way, come on oftener toward night—the patient is rarely free from pain.

There are then no complete intermissions. Before the glaucomatous symptoms fully manifest themselves there is no appreciable increase in tension, and often at the beginning of the attack it is generally impossible to get a view of the fundus on account of the cloudiness of the media. So one cannot speak positively as regards the arterial pulse or optic nerve excavation. In the one case where I had an opportunity of making sections of the nerve no excavation was present. According to Paymstecher, these two latter symptoms are not met with in this variety of the disease.

As regards the frequency of hæmorrhagic glaucoma, fortunately the disease is of comparatively rare occurrence.

In eight years, von Graefe¹ observed in his enormous practice 22 cases. Laquer² in 268 cases of glaucoma met with about three per cent. of the hæmorrhagic variety.

As a general thing the patients affected were hypermetropic, although the disease has been known to occur in an emmetropic individual. Hæmorrhagic glaucoma, as far as I know, has never been seen in connection with myopia; arterio-sclerosis is commonly seen in this class of patients, and this no doubt explains why a not inconsiderable number die sudden deaths.

The disturbances in vision, while sudden and rapidly increasing, do not assume the typical characteristics of primary glaucoma; in other words, there is no narrowing of the visual field on the nasal side. Chromatopsia and photopsia can both be present, but as a general thing they are lacking.

The hæmorrhages which one sees do not appear to be located preferably near the blood vessels, but are to be found mostly in the vicinity of the posterior pole of the eye, the papilla and macula, in a word everywhere, over the fundus.

The hæmorrhages have generally a ragged irregular outline; seldom are they perfectly round. In addition to smaller spots of relatively lighter red, there are to be seen larger hæmorrhages of a more intense hue, which sometimes break through into the vitreous and give rise to extensive opacities of the latter. The retinal veins are tortuous and distended, just what we see in hæmorrhagic retinitis, while the arteries fail to show any increase in size.

The process can remain at this point for a considerable length of time, indeed remissions can

occur now and then, until from time to time new or more extensive hæmorrhages take place. The older hæmorrhages may undergo degeneration (fatty), and assume the white appearance seen in albumenuric retinitis, though the singular grouping of the white plaques as is seen in the latter disease is here absent.

After light perception has gone, and the glaucomatous attacks cease, there occurs not infrequently a detachment of the retina and coincident with this condition, a lowering of intra-ocular tension. Such has been the history of the first case reported in this paper. The eye tension is here below normal, and I am inclined to think that the eye will always remain just in this condition. In other cases we meet with glaucomatous degeneration of the eyeball terminating in either phthisis bulbi or in staphyloma of the cornea or of the sclera.

When one looks into the literature of his subject with reference to the value of iridectomy one meets with rather disheartening revelations. Graefe operated in six cases and with bad result in every case, and hence he advises against³ iridectomy. In several cases immediately after the operation there followed numerous hæmorrhages in the retina. Sometimes the operation had the effect of assuming intra-ocular tension, but the benefit was only a temporary one. Paymstecher and Horner both seemed to have practically failed to get permanent relief through iridectomy.

On the other hand Coccuis,⁴ Becker,⁵ and Laquer⁶, each report a case where the operation was followed by permanent benefit. General experience, though, seems to verify the fact that iridectomy is not apt to be followed by the same good results which one sees when the operation is performed for a primary form of glaucoma, and the reason of this is to be sought for in the fact that the changes in the choroid and retina are so extensive, so vital at the time that iridectomy is indicated, that the blood vessel walls cannot stand the changed condition of the circulation immediately following the operation and the effect of the latter is frequently to precipitate fresh hæmorrhage and to elevate intra-ocular tension.

Each of the three cases reported here presents the typical history of hæmorrhagic glaucoma. And in the response to the several kinds of treatment resorted to, each case brought out much that was interesting and instructive.

Case 1.—Mrs. P., 52 years old. Has for several years been subject to violent attacks of sciatica of the right leg. She has otherwise enjoyed good health, and furthermore, has never complained of her eyes. One evening before retiring she had occasion to close her right eye and im-

¹ Handbuch der gesammten Augenheilk. Graefe u. Saennisch, p. 35.
² Annal d'ocul. L.XI. p. 55.

³ Archiv für Ophth. xv. 3, p. 192.

⁴ Archiv. für Ophth. ix. p. 8-10.

⁵ Klinische Monatsblätter 7, 1869, p. 397.

⁶ Annal d'ocul. lxi. p. 56.

mediately she found that everything in the room appeared as though enveloped in a cloud. She could no longer define the outlines of objects. On getting up the next morning she could not, with her left eye, recognize a person across the room. Her family physician, whom she forthwith consulted, assured her that she was suffering with an attack of indigestion and he treated her accordingly. Not getting better, she came to my office three days after she first noticed the disturbance in her vision, April 29th. R. E. V. $\odot \frac{2.0}{15}$ with + 1.25 D. s. L. E. V. = counts fingers in 6 ft.

The ophthalmoscope revealed numerous small hæmorrhages around the disc and in the region of the macula. Several small white plaques were to be seen near the papilla. There was no optic neuritis, though the blood vessels were dilated, and at several points not remote from the optic nerve they gave evidence of minute ruptures having occurred. Tension of the eye at this time was normal. I made a diagnosis of hæmorrhagic retinitis; a thorough physical examination was made but with negative result. The urine revealed nothing abnormal. I put her on Iod. Potas. 10 grs. three times daily, gave her smoked glasses and forbade her using her eyes. At the end of six weeks neither the objective nor the subjective symptoms had changed. About this time she went north to spend the summer, and a few days later she wrote she thought she could see somewhat better. About six weeks after she arrived she had a violent attack of sciatica and suffered intensely for many hours. No sooner had this attack subsided than she began to suffer torture with her eye. Boring, lancinating pains over that side of the face and particularly severe down the side of the nose. Her daughter wrote a most accurate account of her symptoms and I advised her to consult an oculist immediately, as I suspected glaucoma. She consulted Dr. A. Adams, of Newburgh, N. Y., and it is to his courtesy that I owe the following account of her condition. "In the afflicted eye" he writes, "I find T. + 2, pupil widely dilated and no reaction to light, slight chemosis. Ophthalmoscope showed retinal hæmorrhages, mostly old ones, but there was certainly one fresh hæmorrhage and about the size of the papilla and situated between the latter and the macula. Vitreous a little hazy. R. E. V. = $\frac{2.0}{20}$. L. E. V. counts fingers in 10 inches.

Dr. Adams treated her for several days with antipyrin and eserine, and she got so much better that she determined to return home. The day after reaching home she had an attack, and I was sent for. I found her suffering intensely. The tension of the eyeball was at its maximum and the media were all closed, showing the general disturbance in the nutrition of the eye. Anterior chamber shallow, and scarcely more than light perception was present.

Dry heat (in the form known as Japan Box), and eserine 2 gr.—ozj, instilled every four hours, gave her comfort for two days, when the pains returned with more violence than ever. I then determined to perform iridectomy, which latter was accomplished without accident. Relief was immediate and complete, and lasted for three weeks, after which time the pains returned, and I concluded to resort to paracentesis of the vitreous. This operation was performed with the patient sitting in her chair. I passed in a Graefe cataract knife one-fourth of its length into three points of the eyeball—above, just at the posterior and temporal side of the insertion of the superior rectus, and in the equatorial region at the nasal and temporal side. This was on the 7th of November, since which time she has been absolutely free from pain. There have been occasions when the tension has mounted up, but never a moment of suffering. The pupil is now widely dilated, and the eye is somewhat more compressible than its fellow. Light perception has gone. The retina is detached, and there are numerous striations in the lens. One rather unusual thing occurred in connection with the use of eserine in this case. A violent conjunctivitis followed its constant use several times daily, the lids became swollen and there was present the most profuse lachrymation. These symptoms, which are those of what I should call *eserine conjunctivitis*, disappeared entirely when I stopped using the drug. The disease no doubt resembles in its history what is known as atropine conjunctivitis. I have never seen any mention made in the books of this effect of eserine.

The second case is that of a woman 44 years old, who two days before labor noticed that she saw very indistinctly with her right eye. The labor was a protracted one, and when she got out of bed only light perception remained in that eye. When she consulted me, I found nothing noteworthy about the external appearance of the eye. The ophthalmoscope revealed hæmorrhages covering almost the entire fundus. Vitreous hazy.

There was hyperopic astigmatism against rule in her good eye of $\frac{1}{2}$ dioptré, and with a correcting lens she read $\frac{2.0}{15}$. A physical examination failed to reveal any constitutional disorder.

I told her that nothing could be done, and so put her simply on tonic treatment. Two months later she returned to me, suffering with an attack of glaucoma; the pupil dilated, conjunctiva injected, and T. + 2. I used eserine with no effect whatever. She urged me to take the eye out, but I persuaded her to allow me to perform iridectomy. The operation had the effect of relieving her of pain for a week, when the trouble returned with renewed intensity, and she insisted on having the eye enucleated. I could not induce her to allow me to perform paracentesis. I performed enucleation.

The last case is that of a man 77 years of age, who has always enjoyed fair health. The vision of his right eye suddenly began to fail him, and when he came to me, the vision in that eye was $\frac{20}{200}$. In the other eye he had a hyperopic astigmatism of 3 D., which when corrected gave him V. $\frac{20}{20}$. The diagnosis of the trouble in the right eye was hæmorrhagic retinitis. I saw the patient from time to time for six weeks, the condition of the eye remaining the same. Not long after I lost sight of him for more than a month, when he sent for me to come to him at once. I found him in great agony with his eye, which objectively presented all the symptoms of an acute attack of inflammatory glaucoma. Pupil widely dilated, chemosis of the conjunctiva, and T. + 2. I employed eserine for twenty-four hours, but with no effect. Recalling the good effects of the paracentesis in Case 1, I determined to perform the same operation here. At my next visit, the morning after the operation, the patient remarked that it was the first night's rest he had had for a week.

Relief continued for five days, when he was again attacked with the violent ciliary neuralgia. Once more I resorted to paracentesis, and with the same happy effect. Twenty-four hours later the tension of the eye had noticeably gone down, and the patient was free from pain. I continued the use of eserine three times a day, and the eye, at the end of a week, had almost regained its normal external appearance. The result of this operation was to relieve him for ten days. On the eleventh day he sent for me, and I found him suffering again. The eye was intensely congested, and the anterior chamber was filled with blood, indicating a fresh hæmorrhage. This condition determined me to enucleate the eye, as I did not think any good would follow iridectomy. The eye was therefore taken out and put in Müller's fluid, and later sections were made.

Pathological Anatomy.—Cornea intact throughout. Iris was the seat of numerous small hæmorrhages, most abundant in the neighborhood of the corneal puncture. The canal of Schlemm was not to be seen. Hyaline degeneration of blood-vessel walls. The retina showed hæmorrhages throughout its internal part, extending into the external granular layer, and only exceptionally as far as the external nuclear layer. Inner half of retina presented here and there hyaline-looking drops separated by a reticulum, and no details of this part of the retina could be made out. Between the rods and cones there were to be seen formless drops, staining deeply with eserine. In the choroid there was to be observed an absence of nuclear staining, though this was not restricted to the choroid alone, it being the case also in the retina. The veins of the choroid were enormously distended with blood, and their walls apparently showed hyaline degeneration.

In the papilla and elsewhere in the optic nerve hæmorrhages were present. The muscular coat of the central artery appeared to have undergone hyaline degeneration, as was the case with the arteries in general. Endarteritis was apparent in several of the smaller arteries.

As to the causes working to call forth the disease, in the three cases just reported we certainly have the comparative rigidity of the sclera incident upon the ages of the patients (certainly of two of them), and the refractive condition of the eyes, there being hyperopia and a certain amount of astigmatism in each case. The age of two of the patients, and the fact that they were subject to frequent attacks of sciatica and rheumatism, would lead one to look for general arterio-sclerosis. In the case of the woman who went blind prior to labor, age probably played a minor rôle, but a great and permanent disturbance of the circulatory apparatus must have been associated with the protracted labor, and the walls of the ocular blood-vessels must have undergone changes different from those which are at the bottom of other retinal diseases and which we see every day, and which we know do not lead to hæmorrhagic glaucoma. The family physician told me that he had tested the urine just before labor, and found a considerable quantity of albumen present. Another cause common to all three cases, and which is especially potent in the production of the disease, was the ciliary irritation, a condition tending to increase the fluid contents of the eye, according to experiments made on animals by von Hippel and Gründhagen.

With such numerous hæmorrhages and such widespread disease, the changes in the blood-vessel walls and in the substance of the retina itself must be of the highest grade, and consequently we would look for increased transudation and lessened resorption. It is impossible, of course, to predict anything as regards the continued soundness of the other eye in each case. Von Graefe reports the fact that of twenty-two cases, in ten the other eye had remained perfectly intact, although in this respect the disease can show the greatest variations. In four cases Graefe observed five months later the approach of hæmorrhages in the other eye, though glaucoma was absent. In one case, soon after the disease showed itself in the first eye, an intense retinal hyperæsthesia occurred in the other eye, characterized by seeing sparks and flashes of light. This disappeared. In six cases the second eye was finally attacked and blindness followed. Nearly a year has passed in the first of my cases, ten months in the second and seven months in the last case, and in each instance the other eye retains normal vision. As I said before, it was a matter of regret to me afterward that it was not possible in the second case to perform paracentesis. The patient would consent to no more attempts to

save the eyeball, and if I had the third case to treat over again, I should certainly try iridectomy first, and if necessary follow it up by paracentesis of the vitreous in the manner described above. There is no telling what the combined effect of these two operations might have brought about. They certainly realized every hope in the first case. And though permanent and positive relief was seen in only one case, one will gather from reading the history of the cases, that the whole tendency of the operations of paracentesis and iridectomy was to improve the condition of the patient, and hence I should conclude that iridectomy is not contraindicated in this form of glaucoma, but on the contrary, the operation does give temporary, and may give lasting, relief from suffering, and consequently it should always be tried first; and finally, that in paracentesis in the manner described in Case 1, it is possible still further to ameliorate the condition of the patient. As to prophylaxis in its bearing upon the other eye in each of these cases, I think this simply means sparing the eye all work, and absolute freedom on the part of the patient from mental and bodily fatigue.

And though the results of treatment in these three cases were far from brilliant, it is just in these kinds of extreme eye troubles, which have generally unsuccessful issues, that the histories, when carefully told, benefit us quite as much as brilliant results.

DISCUSSION.

DR. DE SCHWEINITZ reported cases of hæmorrhagic glaucoma with numerous small hæmorrhages, with cupping in one eye and no cupping in the other, due to arterial sclerosis. In the second case, only one eye being affected, there were widespread hæmorrhages obliterating the macula. There was albuminuria, a history of syphilis, and doubtless atheroma of the arteries.

DR. AYRES said iridectomy had been very unsatisfactory in hæmorrhagic glaucoma. He favors enucleation if no other means brought relief.

DR. J. H. THOMPSON does not favor enucleation, but prefers, instead, optico-ciliary neurotomy.

DR. RANDOLPH answered Dr. Thompson that he had seen many failures from optico-ciliary neurotomy in Baltimore, and did not approve it.

BOOK REVIEWS.

ATLAS OF CLINICAL MEDICINE. By BYROM BRAMWELL, M.D., etc., assistant physician to the Edinburgh Royal Infirmary, etc. Volume I, Part 1. Edinburgh: T. and A. Constable. 1891.

The first part of the first volume of this work has just been issued, and treats of Myxœdema; the clinical investigation of cases of Myxœdema; Sporadic Cretinism; the clinical investigation of sporadic cretinism; Myxœ-

dema and Exophthalmic Goitre contrasted; Friedreich's Ataxia; the clinical investigation of Friedreich's Ataxia; notes of three additional cases of Friedreich's Ataxia.

The text is illustrated by five well executed plates, viz: 1, 2, 3, Myxœdema; 4, 5, Sporadic Cretinism.

With this part are also issued two additional plates, the first illustrating Lymphadenoma, and the second, Melancholia with Fear.

It is designed to issue the work in four parts each year, very fully illustrated. If that portion already issued is to be taken as a fair specimen of what is to follow, it may well be regarded as a work of more than ordinary merit. The first yearly volume is to contain thirty plates, 14½ by 10½ inches, colored, black and white, and photogravure, with detailed description of the plates and text. The Atlas will be issued to yearly subscribers only, and it is contemplated to continue the work through three years, and to include at least ninety illustrative plates.

ESSENTIALS OF SURGERY, together with a *Full Description of the Handkerchief and Roller Bandage*. Arranged in the form of questions and answers, prepared especially for students of medicine. By EDWARD MARTIN, A.M., M.D., Instructor in Operative Surgery, University of Pennsylvania, etc. Illustrated, fourth edition, revised and enlarged by an appendix, containing full directions and prescriptions for the preparation of the various materials used in antiseptic surgery, etc. Philadelphia: W. B. Saunders. 1891.

The first edition of this number of Saunders' Question-Compends appeared in 1888, and has now reached a fourth edition. Whatever view may be held as to the value of such aids to students it is evident that there is a demand for them, and this is no doubt increased by physicians who find such compends a convenient mode of reviewing the subject of which each treats, and which is supposed to be brought abreast of the times on that particular subject, so that he may get in a convenient way and in a concise form some of the most recent ideas on the subject, without sifting from the general literature of the subject.

The present number is one of the best of the series. The author may be said to have accomplished his avowed purpose of having furnished the "essential points as a framework upon which more detailed knowledge may be hung." His further claim "to be accurate, concise and modern" is well founded. The additions made in the present edition are noted on the title page.

SYLLABUS OF THE OBSTETRICAL LECTURES in the Medical Department of the University of Pennsylvania. By RICHARD C. NORRIS, A.M., M.D., Demonstrator of Obstetrics in the University of Pennsylvania, etc. Second Edition. Philadelphia: W. B. Saunders. 1891.

The first edition of this Syllabus was issued in 1889. This second edition has some additions, including chapters on infant feeding, pathology of the puerperium, obstetric operations and dystocia.

In addition to the table of contents, an index has been added, and it is interleaved for convenience in note taking. Being largely based on the course of lectures delivered in that University, it doubtless proves a great convenience to the students of that institution to whom it is dedicated, and no doubt will be so, in perhaps a less degree, to students in other institutions. The author may be congratulated on having been more than ordinarily successful in the task which he undertook in preparing the syllabus.

THE CONSTRUCTION OF SCHOOL BUILDINGS.

Read in the Section on State Medicine at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY D. F. LINCOLN, M.D.,

OF GENEVA, N. Y.

CHAIRMAN OF THE COMMITTEE ON SCHOOL HYGIENE OF THE AMERICAN MEDICAL ASSOCIATION.

In dealing with this question, we are obliged to make allowance for difference in circumstances. We demand space, fresh air, light; and these needful things undeniably cost money. The poorer and less enlightened communities will grudge payment, even for such necessities of life; but the number must be very small, of those who have not a disposition to improve, and a willingness to make some sacrifice. The burden does not always fall heaviest upon the poor districts; land costs next to nothing in the country, and the struggle for elbow-room between tall overshadowing buildings is unknown, while in rich cities it may happen that the millions appropriated for public schools are as inadequate as the hundreds granted by a country district.

The city school is greatly restricted in the space available for building; and in no city is this difficulty more pressing than in New York. Without assuming the right to condemn any one's omissions, we may still be permitted to offer suggestions which may meet with appreciation in certain quarters.

The suggestion, then, which is first offered, is to this effect, that it would be well if the space surrounding each school-house could be at the outset ample for the purpose of supplying light, and that regulations might be made to prevent encroachments upon the sky area. It could be ordered, for instance, that the width of such space be made equal to the height of buildings now standing, or likely to be erected, in contiguity; and that the height of such future adjoining edifices should be restricted. It may be difficult to anticipate the future. But surely we need not commit the blunder of allowing only a six or ten foot passage at the side of the school-house—of which it would be easy to point out examples.

To the recommendation of a liberal ground space may be added another of kindred character: that of moderate size and height in the edifice. The reasons for this are various. On the one hand, there are objections to the massing of great numbers of children; there is the difficulty of management to be considered, and other matters, the discussion of which may be omitted here. Apart from this, there are objections to the great, compact house, the central parts of which are remote from the freshness of the outer air and the beneficial effect of sunlight. Then there is the objection to many-storied buildings, on the ground of loss of time in passing scholars to and from the yards at recess, and on the further

ground of occasional injury to the system in the case of girls in their teens, at the period of sexual development.

The safety of the inmates in case of fire should be insured by suitable arrangements of stairs, and by strict drill. I cannot approve of the ladders or twisting stairs of iron openwork clamped to the outside of the building, as a refuge for a crowd of panic stricken children. Safety requires that the ordinary staircases be planned so as to be incombustible, and that they should present no impediment or trap for the foot, such as spiral curves, narrow-cornered steps, steepness or dark passages. Stairways ought to be so placed that every room has access to more than one, in different directions.

Lighting.—The best opinions at present, in this country, seem to agree in preferring light which enters from the left side of the pupils, and in absolutely objecting to that which enters in front. Whether light should be admitted from the right hand or the rear cannot be categorically stated; in some circumstances (as in the case of small country school-houses), it seems a desirable addition to the left-hand light.

There are two mistakes, against which serious warning should be given. One is the placing of windows at a low point, for architectural or other æsthetic reasons. The best place for the light to enter the room is the highest point attainable. Windows should nearly touch the ceiling, and their upper part should be as free as possible from incumbrances which obstruct light. The other mistake referred to is the attempt to light very wide rooms of moderate height by side windows. The poverty of light in such cases is not to be estimated by the ordinary standards, or by one's impressions, but by observing the way in which the horizontal rays of light fall on a book placed flat on the desk as for study.

Verandas are fatal to good working light. The "Italian" awning is nearly as bad. In general, no form of curtain or other screen covering the upper part of a window is allowable except on the ground of strict necessity. If shades are required to exclude the sun, they must be removable when not needed.

The eye should be favored by avoiding the glaring effect of pure white walls; a slight neutral tint, or bluish or greenish, is preferable. The ceiling, however, may be as white as possible.

School-rooms.—Their dimensions are partly dependent on the requirements of ventilation. It may be added, that their length is limited by the distance at which the ordinary eye can read ordinary work on the blackboard, or not greatly over 30 feet. The width should not exceed the moderate dimensions which are compatible with good lighting—from 22 to 25 feet if light comes from one side.

The floors should everywhere be made of material which can be washed conveniently—a wood which will not splinter or wear ragged.

Seats and desks.—The American patterns in common use are at least comfortable—from one point of view. The chairs are very easy to sit back in when one is tired. In this they differ widely from the accepted patterns of the European schools, whose children are taught to sit up straight, and are furnished with short backed seats which support the hips sufficiently, but not the shoulders. These models are strange, to our eyes, and there is little chance of our rocking-chair-loving race adopting them at present. They possess obvious merit, however.

From the Germans we have learned that the front edge of the desk must reach or overhang the edge of the seat. This principle is commonly imitated among us. What we have not yet seen fit to adopt is the no less rational principle that the desk should not crowd the arms and elbows upward. The arms ought to hang so freely that the elbows, when writing is going on, are at the level of the desk. In no other way can we insure a correct—*i.e.* a straight and squared—position in writing.

In conclusion, let me say that a number of points have been left untouched in this paper, which might properly have been treated of, as related to the general subject of construction. This is due to the fact that a special assignment of the subject of drainage and sewage has been made, by which it is placed in the hands of another member of the committee; his work is expected at the next annual meeting.

PRE-COLUMBIAN SYPHILIS.—The growing prospect of a world's fair in 1892 or 1893 arouses an especial interest in things Columbian and pre-Columbian. Possibly among the latter may be classed syphilis. Dr. James Nevins Hyde discusses the question in the *American Journal of Medical Sciences*, and the discussion will, we trust, be continued. America has heretofore accepted too readily the dubious compliment of having bestowed upon civilization the *grosse vérole*. When one recalls what a sty of licentiousness and filth Europe was in the fifteen century, it seems much easier to suppose that syphilis was bred there than that it was imported. Dr. Hyde, however, takes up mainly the question whether the North American Indians of pre-Columbian times left any bones which show evident syphilitic lesions. A good many so called pre-historic bones showing signs of so-called syphilis have been collected. But it has been shown that many of the remains in the Indian's mounds and caves are not pre-historic. Then, so far as the lesions are concerned, it appears to us from the evidence presented that none of them are plainly the results of syphilis.

Dr. Hyde reports in detail the results of a microscopical study of two tibiae from Colorado, made by Dr. T. M. Prudden. These showed the presence of a chronic rarefying and formative osteitis and chronic formative periostitis, changes which might be of syphilitic origin, but much more likely were not.

So far as the bones have yet told the story there was no pre-Columbian syphilis.

Its presence will have to be established by further bony studies, as well as by historical, and perhaps philological investigations.—*N. Y. Med. Record*.

MEDICAL PRACTICE IN CONNECTICUT.—The *Monthly Bulletin of the Connecticut Board of Health* contains the following reply, sent to a doctor inquiring of a State official if he would be allowed to practice in Connecticut by registering his name and the college from which he graduated: "SIR:—Anybody can practice medicine in Connecticut. You do not need to register; you do not need a medical diploma; you do not need to know the difference between opium and peppermint—you do not, indeed, need to know anything. You can simply come and live here, and begin to practice. The laws of Connecticut will sustain you in collecting your fees for professional services, if you render any which you choose to call such. But if you undertake to carry me or my trunk to the depot for pay, you must get a license. If you peddle matches or peanuts, you must get a license. If you collect the swill from your neighbors, to feed your pigs, you must get a license. If you want to empty your cesspool, you must get a license. But you can practice medicine in Connecticut *without a license*."—*Boston Med. and Surg. Journal*.

LEPROSY IN JAMAICA.—Dr. Donovan, in his annual report to the Governor, on the Lepers' Home, Jamaica, estimates the leper population of the island at 450, or one leper to 1,380 of the population. Pending general legislation on the question of isolation, he recommends a prohibitive enactment against lepers keeping provision stores or being employed therein, or in the preparation of food; that no leper be allowed to engage in any of the following vocations, namely: baker, butcher, fisherman, tailor, school-teacher, etc.

FOR PERSISTENT DANDRUFF.—Dr. Stephen recommends that we should use a mixture of 3 scruples each of resorcin, olive oil and sulphuric ether, and 6½ ozs. of alcohol. To be well shaken and applied to the scalp by a bristle brush about twice as large as the ordinary mucilage brush, by insinuating it with the locks of hair; the head to be well washed with soap and warm water twice a week.

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SATURDAY, SEPTEMBER 12, 1891.

TREATMENT OF CROUPOUS PNEUMONIA.

A review made a few years ago of the cases of pneumonia treated at the Massachusetts General Hospital showed that there was little or no difference in the mortality under various methods of treatment; that whether heroic onslaughts were made on the disease by the so-called anti-phlogistic plan, blood-letting, and active purgation, or whether a purely expectant plan of treatment was pursued, or supporting efforts by stimulation were employed, the percentage of mortality was not materially different. Nevertheless, but few practitioners are ready to admit that their efforts in this disease are without avail, although many will be ready to admit that the results of treatment are sufficiently unsatisfactory to warrant careful attention being given to any plan which offers a rational procedure, no matter how widely it may differ from the methods now generally in vogue.

All authorities are agreed that the danger point in pneumonia is the heart, but all are certainly not agreed as to the mechanism of this danger.

We are all too prone to regard the *left heart* as *the heart*, and to forget that there are two hearts, more or less independent of each other. Dr. S. HENRY DESSAU, in the last number of the *Archives of Pediatrics*, reviews the subject quite

fully, referring to the work of Dr. A. H. SMITH, of New York, in a paper read before the Berlin Medical Congress in 1890. Dr. SMITH called attention to the interference with the circulation produced by the engorgement of the lung, and showed that the *right heart*, and not the heart as a whole, was the main source of exhaustion, and that the character of the second pulmonary sound was a better guide to the conditions present than the pulse. The pulmonary circulation is obstructed by the permanent dilatation of the vessels in the engorged lung, and overcrowding of the right heart necessarily occurs. In the systemic circulation, on the other hand, the arterioles are contracted, forcing the left heart to more rapid and more powerful contractions, which result in overfilling the veins, and forcing upon the already overburdened right heart a surplus of blood to be handled. The overcrowding of the right heart from the venous side tends to produce dilatation of the right ventricle before a compensatory hypertrophy can be established. It is not surprising, therefore, that in individuals in whom the nutrition of the heart muscle has been seriously impaired, as in alcoholic or nephritic cases, the mortality from pneumonia should be unusually high.

With this view of the pathology, the treatment, so far as the circulation is concerned, consists in relieving the right heart by increasing the capacity of the systemic arterial system, and by diminishing the pulse rate.

As a means of dilating the cutaneous blood vessels and producing diaphoresis, DESSAU suggests spirits of nitrous ether, DOVER'S powder, or spirits of mindererus. The warm bath at 95° F., or sponging of the entire body with water at 116° F. is also recommended. The warm bath and hot sponging are given for the purpose of dilating the cutaneous vessels and inducing diaphoresis, and should be so conducted as to accomplish these ends. Conjointly with these means, the use of friction to the skin may be advantageously employed.

As a further means of relieving the right heart, efforts should be made to divert the venous blood into the liver, a reservoir capable of holding a great quantity of this fluid. It is also suggested that the increase in blood to the liver will stimulate its functions, among which is to be noted the destruction of poisonous principles in the blood.

For the purpose of stimulating the liver, he suggests the use of small doses of calomel.

Aconite is mentioned as a remedy which, carefully administered, will reduce the heart's action without depression, and furthermore assist in dilating the cutaneous vessels and promoting perspiration.

With regard to digitalis, it is urged that it can only do harm, by contracting the arterioles of the systemic circulation and increasing the force of the heart's action.

The use of aconite and veratrum in pneumonia has long found favor in the hands of many practitioners, who were unable to reconcile their good results with the objections of the theoretical men who insisted that aconite produced slow collapse.

The favorable action of calomel in pneumonia has been often noted by many practitioners, particularly those of the older school, but it seems reasonable to suppose that, with such indications for its use as are given by DR. DESSAU, better results may be expected than could be obtained by a merely empirical exhibition of the remedy.

While seeking measures to relieve the heart of the strains thrown upon it, it should not be forgotten that there are other features to be considered in pneumonia. The disease is accompanied with various nervous manifestations, evidences of the poison at work, which cannot be accounted for simply by the elevation of temperature. These poisons must be directly counteracted or eliminated. Fortunately, the means employed to relieve the right heart also assist in elimination, and in this way are probably doubly useful. But the necessity of using the most appropriate channel of elimination in the particular case must not be overlooked. In some instances, particularly in those in which typhoid symptoms, coma, and low muttering delirium intervene, with low temperature, the modern antipyretics, judiciously used, appear to exercise a truly antidotal specific effect.

How far DR. DESSAU's views may be found to stand the critical examination of the future, they are certainly at present worthy of careful consideration.

THE UNIVERSITY OF VERMONT.—Dr. Condict W. Cutler, of New York, has been appointed Professor of Skin and Venereal Diseases, to succeed Dr. R. W. Taylor, who has resigned.

IMMUNITY AGAINST CROUPOUS PNEUMONIA.

While upon the subject of the treatment of pneumonia, the experiments of Prof. EMMERICH of Munich, relating to the production of an artificial immunity against this disease and to curing the same, should be noticed. EMMERICH has just reported his experiments before the late Congress of Hygiene and Demography in London.

From previous experiments EMMERICH has been led to believe that immunity against infectious disease is produced by a toxine inimical to bacteria, but innocuous toward the cells of the animal body. In an immune animal, at least soon after immunity has been produced, this substance should be found in its blood and other tissue fluids.

By subjecting a rabbit to an intravenous injection of a very dilute but completely virulent culture of the *diplococcus pneumoniae Fränkelii* it is rendered immune. Rabbits so prepared were killed, skinned, divided and rubbed up into a fine paste, which was pressed through the meshes of a clean sterilized cloth. The bloody juice was kept for twelve hours at a temperature of 10 C. (33.8° F.) then sterilized by passing through a Pasteur filter. Twenty-six rabbits, one of which had been subjected to an injection of the immunizing juice, were subjected in an inhalation apparatus to the action of a spray of bouillon culture of diplococci. All died speedily except the one animal protected by the immunizing juice.

In a second series of experiments seven mice were injected with a virulent culture of the *diplococcus pneumoniae*, in quantities varying from 3 c.c. to 5 c.c. Six of them were then injected with the immunizing or curative juice as it may now be called. In 44 hours the unprotected mouse was dead, the autopsy showing diplococci in the blood and internal organs in great quantities, while the other six mice were all well. As these last experiments were made during the last three days of July, we must wait further for fuller returns.¹

In a further experiment with three mice, the first two were injected with .5 c.c. and the third with .3 c.c. of a virulent culture. Five hours later the first two mice received 2 c.c. of the curative juice, but not of a fresh preparation.

¹ Maximillian Herzog, Cincinnati Lancet-Clinic, Vol. xxvii, N. S. 301.

The following day all of the mice were sick, the third being worse than the first two. The first was given an injection of 1 c.c. of perfectly fresh curative juice, whereupon it recovered rapidly. The second and third both died.

THE CONGRESS OF AMERICAN PHYSICIANS
AND SURGEONS.

Washington, September 22, 23, 24. The apparent indications are that this will be a great success, both in attendance and in the character of the papers, with accompanying discussions. The coming together of leading investigators and specialty practitioners in the various departments of our art will be fraught with great good especially to those who attend the Congress, as well as to the profession at large.

The men who have won renown by reason of their attainments, are usually the ones who are most wide awake and ready to pick up and utilize the expressed thoughts of their fellows, while very often their own idols are shattered beyond possible recognition.

Specialists in the great Eastern, Central, Western and Southern cities will do well to place themselves in more close affiliation with each other. Art and science are cosmopolitan. The assemblage of men engaged in similar lines of labor and thought, from every geographical direction, favors the dissemination of knowledge, besides placing themselves one with another in desirable business channels.

The social features of these gatherings of the intellectual laborers in our particular vineyard are hardly, if at all, second to the ostensible purpose of the occasion.

The men who can go, ought to do so as a matter of duty owed to themselves, as well as the more unselfish one they owe to others. It is quite doubtful if any professional workingman's annual income appreciably suffers through his attendance at medical society meetings.

The world has come to not only regard and recognize, but to know that organized labor, is more skillful, more effectual and more complete in its performance of a given work than that which is done under conditions of segregation.

Joined and welded together for a common purpose, a great profession like that of medicine is capable of doing an unlimited amount of good

both for its individual members and for the people at large. No man can alone accomplish and work out of his own ideals, he must have the aid of his fellows. This may be had at a society meeting.

THE "CATHOLEPISTEMIAD OR UNIVERSITY
MICHIGANIA."

Have we a "Catholepistemiad" in our midst? A curious bit of the educational history of the territory of Michigan—inclusive of a medical embryo—has been brought to light in Dr. F. W. BLACKMAR's essay on "State Aid to Higher Education in the United States." Dr. BLACKMAR is a member of the faculty of the University of Kansas, and his essay is one of the circulars of the Bureau of Education. The following paragraph shows that medicine was one of the projected departments of an institution of learning, based on a broad foundation, as far back as 1817, when the population of the territory did not number over seven thousand souls. The grant of a township of land for a seminary of learning was made by Congress as early as 1804, but the enabling act for the establishment of a university did not pass the territorial legislature until 1817. In that year, "the territorial government committed the interests of higher education to the care of the governor and the judges, and it is supposed that through the exertions of Hon. A. B. WOODWARD, then presiding judge of the supreme court of the Territory of Michigan, that the act establishing a university was framed. A portion of this most curious document of the early history of Michigan will be given. It is entitled An act to establish the Catholepistemiad or University Michigania.

Be it enacted by the Governor and Judges of the Territory of Michigan, That there shall be in the said Territory a catholepistemiad or university denominated the Catholepistemiad or University Michigania.

The Catholepistemiad or University of Michigania shall be composed of thirteen didaxum or professorships; first, a didaxia or professorship catholepistemia, or universal science, the dictator or professor of which shall be president of the institution; second, a didaxia or professorship of anthropoglossica, or literature embracing all of the epistemum or sciences relative to language; third, a didaxia or professorship of mathematica

or mathematics; fourth, a didaxia or professorship of physiognostica or natural history, etc. The act thus continues through the whole range of the thirteen didaxum. The remaining nine are as follows: Natural philosophy, astronomy, chemistry, medical sciences, economical sciences, ethical sciences, military sciences, historical sciences, and intellectual. The university was to be under the control of the professors and president, who were to be appointed by the governor, while the institution was to be the center and controlling power of the educational system of the State. It was to be supported by taxation by an increase of the amount of taxes already levied by 15 per cent. Also power was given to raise money for the support of the university by means of lotteries.

This remarkable document was not without its influence in shaping the public school policy of Michigan, but it was many years before the State approximated its learned provisions. Impracticable as this educational plan appears for a handful of people in the woods of Michigan, it served as a foundation upon which to build. The officers and president were duly appointed, and the work of the new university began at once."

Although the teaching of medicine was thus early taken into consideration by the founders of a great State, thirty years elapsed before the first medical faculty of Michigan took on its outward form and feature.

ONE THOUSAND CASES OF PNEUMONIA TREATED IN HOSPITAL.

DR. FENWICK, of the London Hospital, has given to the *Lancet* an analysis of 1,000 cases of pneumonia seen in that institution during the last ten years. Cases admitted shortly before death took place or twenty-four hours before a critical turn in the disease, are omitted from this report. In the sthenic cases, which numbered 500, the treatment was generally along the three general courses described as follows:

First. Treatment by means of hot applications to the chest, in conjunction with remedies having tonic and expectorant properties. The mortality in this class of cases exceeded 20 per cent. Second. Cases in which the only treatment was by quinine in large doses. The mortality here exceeded 20 per cent. Third. Cases

where the treatment was by various antipyretic measures. In twenty-six of these, cold applications to the chest were employed, with a mortality of 15 per cent. The cold pack was tried in an equal number of cases, with about the same mortality. Cold sponging, used in fifty-six cases, had a mortality of 13 per cent. The "ice cradle" was used in forty-three cases, mortality only 7 per cent. By all the various cold applications 108 cases were treated, with 10 per cent. of failure. By all other grouped phases of treatment, the losses were double those by the cold method. Stimulants were given in these latter cases whenever indicated. Cold appears to be the best of the antipyretics for the class of patients with which DR. FENWICK has to deal, chiefly for the reason that it has less of depressant action upon the heart than antipyrin, quinine, etc. In the earlier stages of the disease, the true treatment involves a reduction of the temperature without cardiac depression. In the later stages, the pulse is the great guide for treatment in the matter of strengthening the recuperative forces by means of stimulants. In many cases, camphor, digitalis and alcohol will not be needed, but in impending cardiac failure these agents become vastly important. The period of crisis, also, is attended with especial dangers referable to cardiac incapacity, and it is necessary to be watchful and guard the patient, at this stage, by means of alcoholic and other suitable forms of stimulation.

A NEW DISEASE.

A disease popularly designated in the south of France under the name of "maladie des cannes de Provence," or in other words, the cane-disease, has recently been described by DR. VINCENTE GOMEZ in the *Revista de medicina y cirugía prácticas*. He reports three cases of occupational disease, apparently due to the reeds. His first case was that of a man of 50 years, who had worked with the reeds for ten years. The canes lately used had been collected during the previous winter, and were covered with a fine ash-like dust, which was diffused through the air as the canes were moved. On the day following the first active diffusion of this dust, the man was taken with an intense headache, loss of appetite, insomnia; perspiration became profuse and urine scanty. A painful tumefaction of the nasal and

uccal mucous membrane followed, with epistaxis. There was also some irritation of the external genitals. On the sixth day, there was some low febrile action, a slight amount of albuminuria, anorexia, with dry tongue and fetid breath, dull red, scaly eruption on the cheeks; prepuce inflamed and very painful, with complete phimosis. In the two other cases the attack was less marked, for the workmen, seeing the dust rising in a cloud when the canes were agitated, and knowing something of its irritating properties, quit their work. This dust is most abundant upon those canes that are cut on marshy ground after exposure to both heat and humidity. The gravity of the morbid influence of this dust seems to be in proportion to the amount of it that is present and diffused through the atmosphere wherein the cane-workers are employed, and as remarked above, those who have had experience with this *maladie des cannes* find it expedient to escape from the dust when a large package of their working material is opened or agitated. DR. GOMEZ attributes the affection to products of fermentation (zymosis), which develop upon the reeds. A microscopical examination has not yet been reported.

REFRIGERANT LANOLINE UNGUENTS.

Professor UNNA gives in the *Therapeutische Monatshafte* the results of numerous experiments with lanoline and ointments made therefrom. Among the earlier researches of himself and others it was thought advantageous to mix water with lanoline in order to get a good base for a variety of cooling unguents, this being done for the reason that very considerable quantities of water—or aqueous solutions—could be incorporated with lanoline, and it came to be thought that these mixtures would have refrigerant properties in consequence of the continuous evaporation of their contained water, by the heat of the surface of the body. But the results did not at all confirm the hypothesis, for even if such lanoline and water ointments did appear at first to be cooling, this sensation disappeared quite rapidly and was followed by a sensation of heat. UNNA then discovered that an admixture of lanoline with fats will take up large quantities of aqueous solutions, and yield combinations that are continuously and in a high degree cooling. Hence, according to

UNNA'S explanation, it is to be assumed that the anhydrous lanoline holds the water too closely, so that evaporation cannot occur with sufficient rapidity, but by mixing fat or oil with it the compound is rendered less tenacious of water, and therefore the desired degree of evaporation can quite readily take place. UNNA reckons that the best proportion of lanoline: of glycerine fats: and of aqueous solutions is as 10.0: 20.0: 30.0, for the compounding of a cooling ointment; while if he has in view a cooling cream (*cremor*) the proportion should be 10.0. 20.0: 60.0. A simple refrigerant ointment, to be used as a cold cream, may be made as follows:

Anhydrous lanoline	10.0
Benzoated lard	20.0
Rose water	30.0

The following is a lanoline imitation of GOU-LARD'S cerate:

Anhydrous lanoline	10.0
Benzoated lard	20.0
Solution of subacetate of lead	30.0

A lanoline salve for burns is the following:

Anhydrous lanoline	10.0
Benzoated lard	20.0
Lime water	30.0.

A refrigerant zinc ointment:

Anhydrous lanoline.	10.0
Benzoated zinc ointment	20.0
Rose water	30.0.

UNNA advised that, in this form of cooling unguents, only the anhydrous lanoline (*lanolinum anhydricum*) should be prescribed. These formulæ are designed for extemporaneous use, and are unsuitable for storing.

POISONING BY SULPHONAL.

A writer in the *Medical Press and Circular* gives a caution regarding the very indiscriminate use to which sulphonal is frequently put even by the laity. This drug was introduced about three years ago as a perfectly safe soporific, and corroborative testimony of this hopeful candidate have been abundant. Latterly there have been a few contrary reports about the safety and efficacy of the remedy, and the size of the maximum or poisonous dose could not be unanimously agreed upon. We have not a few cases on record where about three tablespoonfuls have been taken to produce sleep; in one of these cases the sleeper slept the greater part of five days and a half with-

out permanent injury to his nervous system. Another person took a dose about one-third smaller, but never reawakened. A more unusual and extreme case has recently been reported by DR. ERNEST NEISSER. A chemist's assistant, aged fifteen years, took with suicidal intent the contents of two boxes containing fifty grammes each, equivalent in all to three ounces, and over, of the fine pulverized sulphonol. The greater part of the drug was taken mixed with water, but some part of it was swallowed dry, and all of it was ingested within forty-five minutes. Six hours later he was found lying in a comatose sleep and was sent to a hospital, where he lay five days and nights in an unconscious condition. On the sixth day the awakening process took place gradually and on the ninth day he was discharged cured; he was apparently perfectly recovered from all the after-effects of the enormous doses he had taken. In the great disparity of these recorded cases, we read the lesson either of a want of uniformity in the manufacture of the drug, or of an undiscovered "personal equation" in those cases where the comparatively small dosage resulted fatally. At all events, a certain amount of caution should be observed when ordering the drug for patients who have not heretofore been brought under its influence.

SILVER CHLORIDE IN WHOOPING-COUGH.—Lœffler advises the use of freshly prepared chloride of silver in the prevention and treatment of whooping-cough. As given in the *Boston Medical and Surgical Journal*, his preferred combination is the following: Chloride of silver (freshly prepared), $1\frac{1}{2}$ grains; water, 2 pints; hyposulphite of sodium, a saturated solution. Mix. Use by an atomizer, the spray being directed into the pharynx. Repeat the application every two or three hours.

AT THIS season of the year the conditions of travel are as nearly perfect as possible, and for those going from south and west points, a railway ride over the mountains, by way of the Chesapeake and Ohio route, is a luxury that is charming beyond description, while the car service is as perfect as one may expect to find on wheels. The delegates who attended the late meeting of the American Medical Association and went over

this route, were profuse in their expressions of pleasure and appreciation. Wisely, the Arlington Hotel has been made the professional headquarters of the Congress of Physicians and Surgeons. The accommodations of this hostelry are ample, and in every respect equal to the demands of the most fastidious. Those who go and want to be in the swim should engage rooms at the Arlington.

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

For a time during the month of August just past, the temperature was higher than for many years previously in this city; yet, strange to say, the fatal results due directly to the heat were proportionally very small. The total number of deaths directly attributable to the heat was 48, and of these, 37 occurred during the three hottest days, August 10, 11 and 12; when the highest point registered by the thermometer was respectively 98, 95 and 92 degrees in the shade, and 135, 134, and 133 in the sun. The statistics of the Health Department fail to show any such register since 1866, when the complete records begin. These records show that the heated term in July 1872, was the most fatal that the city has experienced. During this famous hot week which ended on the sixth of July, the mortality rose from 807 (that of the previous week) to 1,591. The following extract in regard to this week is taken from the books of the Health Department:

"Although an excessive mortality for the summer, as compared with the rest of the year, is periodical in New York, the unwonted period of its occurrence in 1872 was peculiarly striking. The maximum mortality of the year had never previously been recorded so early in the season. It will suffice to go back as far as 1855 in corroboration of this fact. From that time during ten successive years, the greatest weekly number of deaths was never attained until the third week in July; in one year (1857) it was delayed until September, and in six out of the ten until August."

The highest temperature reached on June 30, July 1, 2, 3 and 4, in 1872, was 95, 95, 96, 94, and 95, respectively, in the shade, and 124, 125, 128, 120 and 123 in the sun; while the mortality from sunstrokes on these days was respectively 7, 34, 68, 43 and 44. These figures show that, in spite of the fact that the temperature was markedly higher in the hot spell in August of this year, the mortality of that in July, 1872, was markedly greater than has been the case in the latter. A possible explanation of that fact may be found in the circumstance that, whereas in 1872, the extreme heat came suddenly at the beginning of the season, thus finding the population totally unprepared for the severe strain, this year the trying time very late in the season, after several weeks of warm weather, which gave the people a chance to be prepared for it.

Since 1872, there has been no year in which the number of deaths from sunstroke has approached its large total of 320, although six years before that, in the summer of 1866, the number nearly equalled that, viz.: 310. Only three times within the past seventy years has the mercury in this city reached or exceeded the 100 mark. In July, 1821, the temperature reached 100 degrees in the shade, and in July, 1825, it reached its highest known record of 107. There are, however, no statistics preserved of the mortality of either of those months. The third time was in September, 1881, when the mercury registered 101.

It seemed appropriate that during the hot weather of August, the first permanent public baths ever established in New York should be opened to the public. The free baths along the two river fronts of the city are, of course, an inestimable boon to the poor; but in them the water is not always as clean as could be desired, and, from the nature of things, they can be enjoyed only during a comparatively limited portion of the year. The "People's Baths," which have now been inaugurated, not by the city, but by the Association for Improving the Condition of the Poor, it is proposed to keep open for fifteen hours a day during every day of the year. The system adopted is that of the rain or shower bath now in successful use in Vienna and other European cities, and it was principally due to the advice of Dr. Simon Baruch, who is such a high authority on balneology and hydro-therapeutics, that this plan was followed in the construction of the baths. Early last spring he read a paper before the Section of Hygiene of the New York Academy of Medicine, in which he urged the superior cleanliness and economy of the rain bath system for general use, and made a forcible plea for the establishment of permanent public baths of this character in New York.

The matter was at once taken up by the Association for Improving the Condition of the Poor, a society which for many years has been doing a vast amount of good by systematic and intelligent charitable work. To quote the language of the President, in his address on the occasion of the formal opening of the baths, "this Association is not merely a relief society, but it has ever in view the amelioration of the conditions, often unhealthy and uncomfortable, under which so large a proportion of the inhabitants of the city are compelled to live. It strives to better these conditions through its sanitary department, which is in constant communication with the Board of Health, receiving from the latter the most effective advice and coöperation. It also carries on a great work in sending 1,500 to 2,000 people, chiefly mothers and children, weekly to its establishment ononey Island, where they have fresh air, abundant food, sea bathing, and much innocent enjoyment."

Some time ago the New York City Mission had received a donation amounting to over \$6,000, for the purpose of establishing free baths, but, as its managers did not care to undertake this work, they very generously turned over this fund to the Association, and at the same time offered a suitable site in the midst of the East Side tenement house district, for the construction of the baths. The building, exclusive of the land, has cost

about \$25,000, and its facilities are capable of accommodating nearly 1,000 bathers daily. A charge of 5 cents is ordinarily made for each bath, including the use of a good towel and the present of a small cake of soap, but provisions have also been made by which the very poorest can obtain their baths free. As the male and female departments are entirely distinct throughout, women and girls can bathe at all times, and not merely on certain days or at special hours.

Dr. Abram Du Bois, one of the most honored members of the profession in New York, died on the 29th of August, in the 82d year of his age. He was one of the most generous benefactors that the Academy of Medicine ever had, and the large and handsome hall in the rear of the old building on 31st street, with a meeting room below and accommodations for the library above, was entirely his gift. He was one of the founders of both the New York State and County Medical Associations, and was deeply grieved at the course of the Academy of Medicine in repudiating the National Code of Ethics. At one time he signified his willingness to give the handsome sum of \$60,000 for the construction of a permanent building for the State Association in this city, provided a certain amount was subscribed by other Fellows of the Association; but the desired fund was never raised.

P. B. P.

NECROLOGY.

DR. ABRAM DUBOIS, of New York City, died August 29, aged eighty-one years. From the time of his graduation, in 1835, at the College of Physicians and Surgeons, to his retirement from active practice, about 1880, Dr. Du Bois was noted for his devotion and generosity toward every worthy professional undertaking. The Academy of Medicine, in one year, received from him \$3,000 for library purposes. He was a pioneer in specialism in New York, giving his chief attention to ophthalmology from the outset of his professional life. He was for many years the senior consulting surgeon to the Eye and Ear Infirmary, and a liberal benefactor thereto.

THE POINT OF SELECTION IN PARACENTESIS OF THE ABDOMEN.—In an editorial in the *International Journal of Surgery*, May, 1891, the question of paracentesis abdominis is discussed, and a case of Frzebicky's (*Archiv. fur klinische Chirurgie*) quoted, in which profuse hæmorrhage occurred from a puncture made at Munro's point, which is midway between the umbilicus and the anterior superior spine of the ilium. If the puncture is made at this point a considerable number are apt to be followed by hæmorrhage. Directly in the linea alba is the best place, and if this is not possible it should be made in the outer half of a line drawn from the umbilicus to the anterior superior spine of the ilium.

MISCELLANY.

THE INTER-CONTINENTAL AMERICAN MEDICAL CONGRESS.—Dr. J. C. LeHardy, member of the Auxiliary Committee of the Inter-Continental American Medical Congress for Savannah, Ga., writes to Dr. C. A. L. Reed, Chairman of the National Committee, as follows: If money can be secured we ought to make the occasion an epoch in the history of medicine. It seems to me that the distinct feature of this Congress should be to have as complete a display as possible of the medicinal plants and medicinal preparations, of the surgical instruments and appliances, electric and other machinery, of all scientific instruments and devices *used at this time* in the different parts of North and South America and islands surrounding, or, if possible, in the whole world, by the savages and semi-civilized, by the negro slaves and those that have been freed, by backwoods quacks and doctors and by those who have attained the highest grade in civilization and knowledge. Competent persons should be employed as soon as possible to collect these among the Indians and from the Negroes on the Atlantic Coast and in Central and South America.

Dr. Reed will lay the suggestions before the National Committee which meets in St. Louis, October 14th.

THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.—Programme of the Fourth Annual Meeting, to be held in the hall of the Academy of Medicine, 17 West Forty-third street, in the City of New York, Thursday, Friday and Saturday, September 17, 18 and 19, 1891. All persons interested are most cordially invited.

First Day, Thursday, September 17, 1891.

Business meeting at 9:30 o'clock A.M., for Fellows only.

Morning session, 10 o'clock.

1. Address of Welcome and Response, Drs. Roosa and Rohé.

2. Post Partum Hæmorrhage; Its Etiology and Treatment; Dr. Aug. P. Clarke, Cambridge.

3. Removal of the Kidney for Disease, with Cases, Dr. William J. Asdale, Pittsburgh.

4. Another Method of Palpation of the Kidney, Dr. Robert T. Morris, New York.

5. Intra-Uterine Irrigation after Labor, Dr. Lewis S. McMurtry, Louisville.

Afternoon Session, 3 o'clock.

6. Is a Child Viable at Six and a Half Months? Dr. Llewellyn Eliot, Washington.

7. Some of the Dangers Incident to Delay in Operating for Uterine Myomata, Dr. Isaac S. Stone, Washington.

8. How Should We Proceed when Abdominal Tumors are Complicated by Pregnancy? Dr. James F. W. Ross, Toronto.

9. Thoughts Pertaining to Maternal Impressions During Gestation, Dr. William S. Stewart, Philadelphia.

Second Day, Morning Session, 10 o'clock.

10. Removal of the Uterine Appendages, with Results, Dr. Milo B. Ward, Topeka.

11. A few Abdominal Sections Selected from my own Work, Dr. William H. Myers, Fort Wayne.

12. The Prevention of Secondary Peritoneal Adhesions by an Aristol Film, Dr. Robert T. Morris, New York.

13. The President's Annual Address (12 o'clock M.), Dr. Adam H. Wright, Toronto.

Afternoon Session, 3 o'clock.

14. Asepsis in Abdominal and Pelvic Surgery, Dr. William H. Wathen, Louisville.

15. A Case of Cholecystotomy and Cholelithotripsy; Death from La Grippe on the 21st day, Dr. William Wotkins Seymour, Troy.

16. Report of Cases of Cholecystotomy, with Special Reference to the Treatment of Calculus Lodging in the Common Duct, Dr. A. Vander Veer, Albany.

17. Femoral and Ventral Hernia in the Female, Dr. Henry O. Marcy, Boston.

Business Meeting at 7:30 o'clock for Fellows only.

Third Day, Morning Session, 10 o'clock.

18. Some Moot Points in Ectopic Gestation, Dr. X. O. Werder, Pittsburgh.

19. Ectopic Pregnancy; When Shall we Operate? Dr. Rufus B. Hall, Cincinnati.

20. Trendelenburg's Posture in Gynecology; With Demonstrations, Dr. Florian Krug, New York.

21. Treatment of Minor Lacerations of the Perinæum, Dr. George R. Shepherd, Hartford.

22. Peritonitis, Dr. Mordecai Price, Philadelphia.

Afternoon Session, 3 o'clock.

23. Peritonitis, Dr. Edwin Ricketts, Cincinnati.

24. Manual Rectification of Certain Malpositions of the Head in Labor, Dr. William H. Wenning, Cincinnati.

25. A Plea for Early Hysterectomy and Puerperal Hysterectomy, Dr. Joseph Price, Philadelphia.

26. Observations on the Surgical Management of Pelvic Abscess, Dr. Charles A. L. Reed, Cincinnati.

27. The Essential Question of Drainage in Pelvic Surgery, Dr. Lewis S. McMurtry, Louisville.

The Windsor Hotel, Fifth Avenue and Forty-seventh Street, will reduce its regular rates to Fellows and guests of the Association.

AUSTIN DISTRICT MEDICAL SOCIETY.—The sixteenth quarterly meeting of the Austin District Medical Society will meet at Austin, Tex., Thursday, September 24, 1891.

Officers: J. W. McLaughlin, M.D., Austin, President. W. A. Ellison, M.D., Manchaca, First Vice-President. J. W. Hamilton, M.D., Lampasas, Second Vice-President. T. J. Bennett, M.D., Austin, Secretary and Treasurer.

Censors: T. O. Maxwell, M.D., Fiskville, Chairman; S. E. Hudson, M.D., Round Rock; F. R. Martin, M.D., Kyle; A. N. Denton, M.D., Austin; J. A. Davis, M.D., Austin; H. H. Thorpe, M.D., Liberty Hill.

The Society will meet in Medical Hall, and will be called to order promptly at 9:30 A.M.

Programme, Morning Session:

1. Reading of Minutes.

2. Application for Membership.

3. "Syphilis," by Dr. C. O. Weller; discussion opened by Drs. Matt. M. Smith and H. H. Thorpe.

4. "The Advantages of the Supra-Pubic Operation in Cystotomy," by Dr. W. M. Cunningham; discussion opened by Drs. W. J. Matthews and J. W. Hamilton.

Afternoon Session, 2:30 o'clock.

5. "Acne," by Dr. F. E. Daniel; discussion opened by Drs. Fannie Leake and L. H. Hardy.

6. "Biliousness," by Dr. W. E. Shelton; discussion opened by Drs. J. A. Davis and C. A. Danforth.

7. Voluntary Papers.

8. Verbal Reports of Cases.

9. Unfinished Business.

10. New Business.

J. W. McLAUGHLIN, President.

T. J. BENNETT, Secretary.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from August 29, 1891, to September 4, 1891.

Capt. Adrian S. Polhemus, Asst. Surgeon, granted leave of absence for one month, to take effect on or about September 3, 1891.

Surgeon J. V. D. Middleton, U. S. A., is granted leave of absence for fifteen days.

Major James P. Kimball, Surgeon U. S. A., is granted leave of absence for twenty-five days.

The Journal of the American Medical Association

VOL. XVII.

CHICAGO, SEPTEMBER 19, 1891.

NO. 12.

ORIGINAL ARTICLES.

PERIMETRIC OBSERVATIONS ON THE INFLUENCE OF ESERINE AND IRI- DECTOMY IN CHRONIC GLAU- COMA.

Read in the Section of Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY G. E. DE SCHWEINITZ, M.D.,

OPHTHALMIC SURGEON TO THE PHILADELPHIA AND CHILDREN'S HOSPITALS; OPHTHALMOLOGIST TO THE INFIRMARY FOR NERVOUS DISEASES; LECTURER ON MEDICAL OPHTHALMOSCOPY IN THE UNIVERSITY OF PENNSYLVANIA.

The best treatment for chronic glaucoma has often been discussed, but even at this time considerable difference of opinion exists in regard to the most satisfactory method, while the prognosis of the disease, depending as it does upon many factors, is always a doubtful quantity even after the most skilfully performed surgical interference. Most surgeons will, I think, subscribe to the doctrine of Dr. Bull, who says, "It seems to be our duty to operate in cases of chronic progressive glaucoma, and the earlier the better." It is presupposed that the patient has previously been warned of the nature of this disease to progress towards blindness and, as Priestley Smith has said, of the uncertainties which beset the operation. When a case of chronic glaucoma is under observation and the surgeon is weighing the chances for and against operation, it becomes necessary not merely to test the acuity of vision, but to have frequent information in regard to the field of vision, although, no doubt, it is perfectly true, as Dr. Bull further has said, that the condition of the field of vision is no constant guide either in forming a prognosis as to the progress of the disease or in deciding as to the time of operation. The picture of chronic glaucoma is a very familiar one, and we are all familiar with the so-called simple varieties of the disease in which the front of the eye exhibits practically no signs of disease, the anterior chamber may be of good depth and the iris prompt in its reactions to light and myotics, in which there is sometimes never any perceptible increase of tension, or this is only temporary in its character, but in which there is a shallow excavation of the

disc, glaucomatous in its type, some decrease in vision, and contraction of the field. Since the days of Laqueur the use of myotics in the treatment of glaucoma has formed an important part of the treatment of the therapeutics of this disease, and there can be no question of the value of eserine and pilocarpine in acute and subacute forms of glaucoma, where for any reason it is necessary to delay operation, or where it may be wise to attempt a reduction of the tension before an operation is undertaken. It is very definitely ascertained that a myotic by contracting the pupil lowers the tension, if this be abnormally raised, and that by the same action the meshes of Fontana's space are widened, helping in the absorption of the fluid. It is, however, also ascertained that strong solutions of eserine, especially if frequently repeated, are likely to irritate the ciliary body and cause a spasm of accommodation; indeed iritis itself is known to follow the too vigorous application of a strong solution of a drug of this character. The employment of eserine or pilocarpine in chronic simple glaucoma, especially if there is no decided increase of tension, and if the anterior chamber is moderately deep, does not seem to present itself as favorably as in those instances, where there is a distinct rise of tension, narrowing of the anterior chamber, swelling forward of the lenticular system, and probable blocking of the filtration angle. Nevertheless it is a very universal custom to prescribe eserine or pilocarpine in such cases while the surgeon is watching the disease and making up his mind as to the propriety of operative interference. Perhaps sometimes he is induced to give this drug by the feeling that he has applied a salve to his conscience at the same time that he has ordered a drug which is set down as one of the methods of treatment in glaucoma, although he probably believes with Nettleship that eserine, except very rarely, cannot stop the progress of chronic glaucoma. The following cases are reported as examples of the value of this drug in the management of chronic glaucoma when operative interference was declined, and illustrate graphically the influence of the drug in widening and maintaining the field of vision, and also its occasional entire insufficiency to control the disease.

Case 1. Chronic Simple Glaucoma; No sub-

acute Attacks.—W. G. N., a man aged 72, an American by birth, applied for treatment November 11, 1890; has always been dyspeptic. He has had no recent severe illness except a pleurisy from which complete recovery has taken place. Some months ago his right eye appeared to him to be dim; he has never had any pain or any redness of the eye, "but thought his glasses were not right." In the right eye the pupil is prompt, the anterior chamber of moderate depth, the iris of good color, the cornea clear and not anæsthetic; the optic disc is a small, vertical oval with a deep cup ($-2.D.$) passing completely to the edge on the temporal side and nearly to the margin of the nasal half. The disc is surrounded by a semi-atropic crescent on the temporal side; there is a strong venous but no arterial pulse; $T + ?$; a few striæ in the anterior cortex of the lens. In the left eye, cornea, iris and pupil of the same character as just described; some striæ in the lens; an oval disc, rather gray but not cupped; there is a venous pulse. The field of vision of the right eye at this date is represented in diagram 1, namely, distinct contraction of about twenty-five degrees upon the nasal half, and a narrow rim of contraction above and in the upper temporal portion. The field of vision of the left eye was normal in all respects. The patient's refraction was as follows:

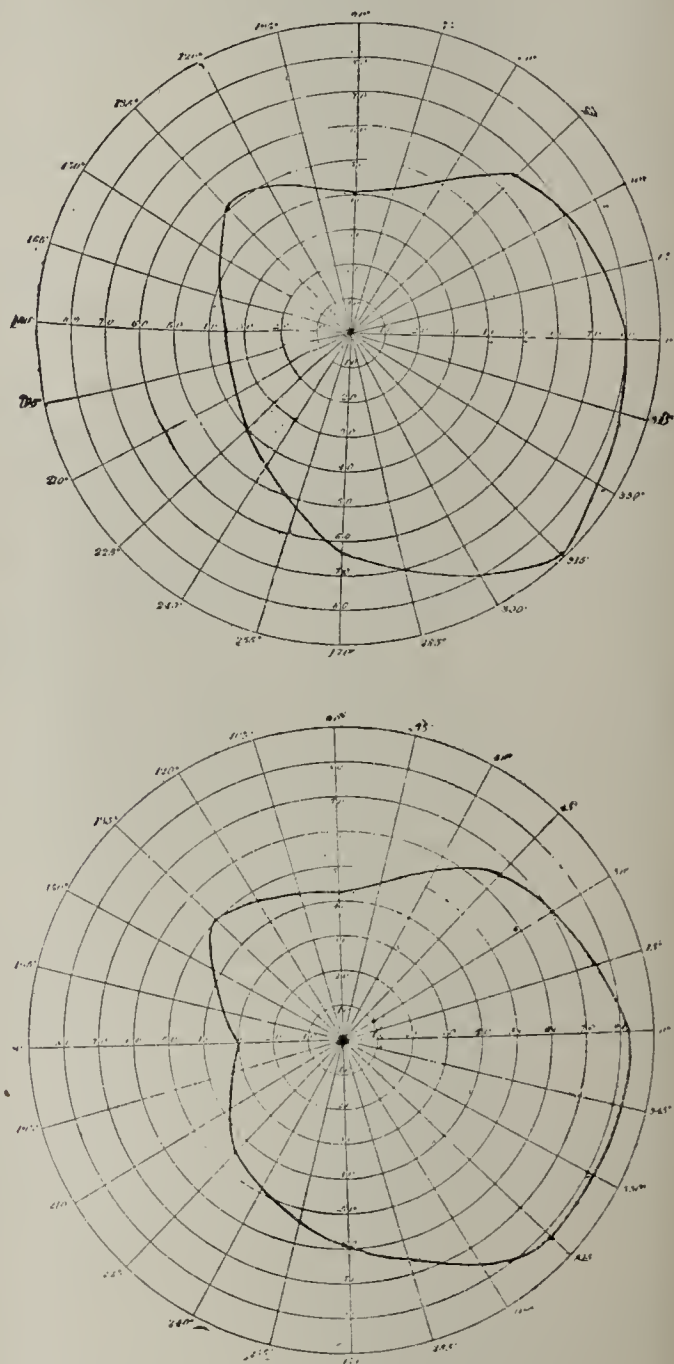
O. D. $+ 1. \bigcirc + .50$ axis $V \frac{2.0}{3.0}$. O. S. $+ 1. \bigcirc + .75$ axis $H \frac{2.0}{2.0}$.

Eserine, gr. $\frac{1}{24}$ to the ounce was ordered three times a day. One week later the vision remained nearly the same ($\frac{2.0}{3.0}$) and the field of vision about the same with perhaps a slight increase of the contraction upon the nasal side. (Diagram 2). The strength of the eserine was now doubled, namely, $\frac{1}{12}$ of a grain to the ounce. One month later, December 10, 1890, the field presented the characters seen in diagram 3, namely, the same contraction above and to the upper temporal side but distinctly less contraction to the nasal side. There was no pain or discomfort, and the patient pursued his usual occupation, necessitating a deal of eye work.

Again, about a month later, January 3, 1891, he reported, stating that for some days his eye had felt uncomfortable, not exactly a pain but a dull aching sensation with a curious feeling as if an insect was crawling back of it, and with increase in his dim vision. He had been somewhat irregular in the use of his eserine. The vision then was O. D. $\frac{2.0}{7.0}$, O. S. $\frac{2.0}{7.0}$, and the field of vision as seen in diagram 4, namely the same peripheral contraction above and to the upper temporal side with a contraction which now extended more decidedly below and in the lower and inner quadrant; the eserine of the same strength (gr. $\frac{1}{12}$ to the ounce) used frequently every three or four hours for a week, then gradually lessened to three times a day. In a week

the field had returned to almost exactly the appearance it presented in diagram 3. The treatment was continued, the patient occasionally taking nux vomica and strychnia in addition, and on the 16th of March, or four months after he was first seen, the vision was $\frac{2.0}{3.0}$ as at the original visit, and the field presented the characters seen in diagram 5, namely, the peripheral contraction above and in the upper temporal portion having disappeared, and only a slight nasal contraction remaining. This character of field obtains at the present time. It may be stated that this patient was seen by Dr. Norris about six months before I examined him, and the same conditions were

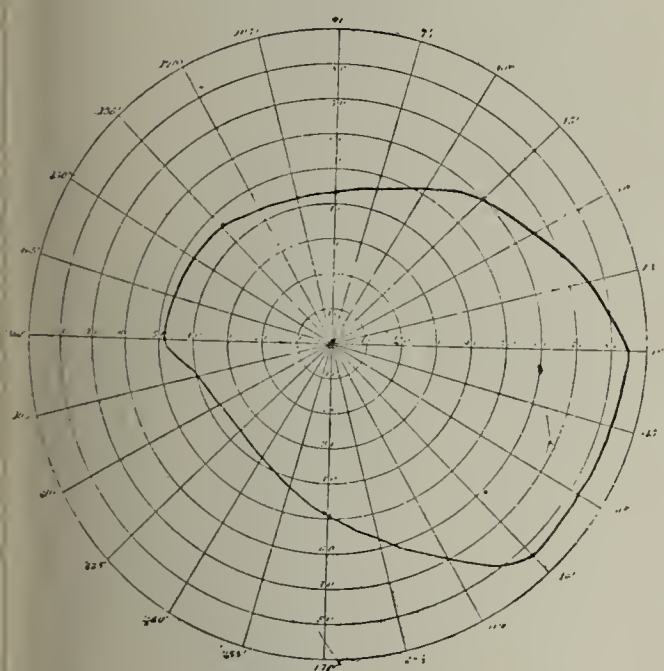
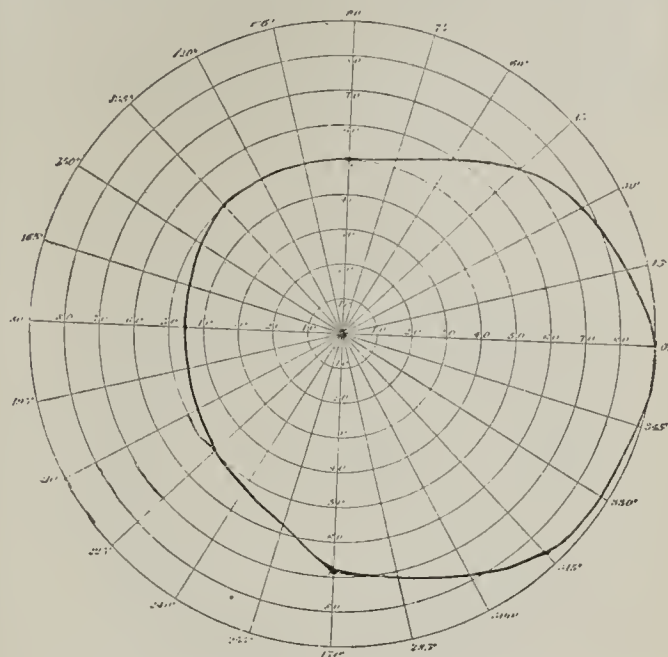
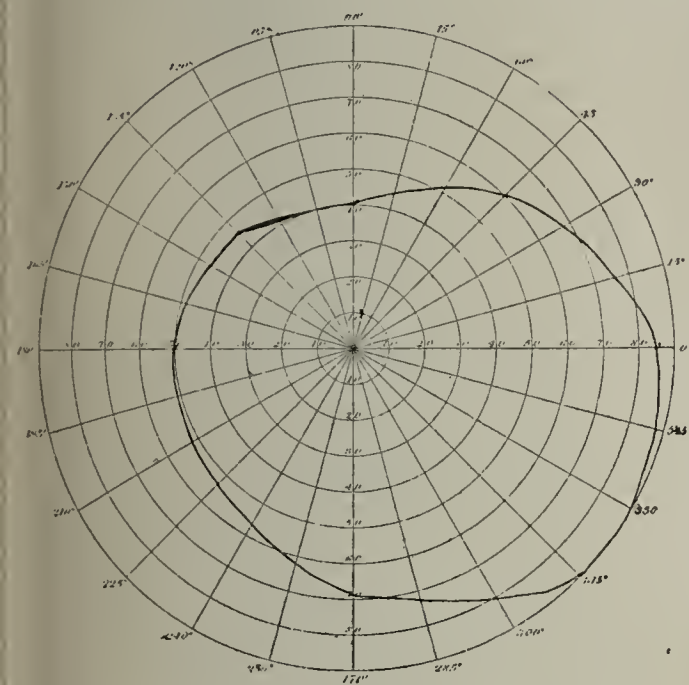
Adapted to the "M. B." Perimeter.



present which I had noted at his first visit. He was given eserine at that time and advised to use it, but he was not at all regular in its employment. We may hence say that for nearly a year this patient has used eserine off and on, and that for five months of that time he has instilled a so-

tion of the drug with pretty constant regularity. I would note as points of interest the gradual widening of the field of vision in all particulars in so much that there is complete restoration on the upper and temporal portions, and the only remaining portion of contraction being and upon the nasal side which, at its widest part, is about fifteen degrees. There has never

this case; in fact, the tension has always been a doubtful + so that it seems to show that even in the absence of a decided elevation of intraocular tension eserine has some power in improving the nutrition of the eye and causing a restoration in a contracted field. The slight tonic doses of strychnia and nux vomica, which this patient took from time to time, can scarcely be account-



any subacute attack, although on one occasion a dull, aching pain was associated with a recession of central vision and an increase in contraction of the visual field which again cleared out under an increased frequency in use of the drug until the favorable result noted chronically in diagram 5, was obtained and is maintained. If there is any favorable time for operation it certainly is present now. This has been advised and will be done provided consent is obtained. I would particularly point out that there has never been any increase in tension in

able for the favorable result, although I am convinced that the accuracy of the statement of Dr. Henry D. Noyes, that strychnia in high doses produces temporary improvement in vision, perhaps in those cases especially which as he says border closely upon simple atrophy of the nerve.

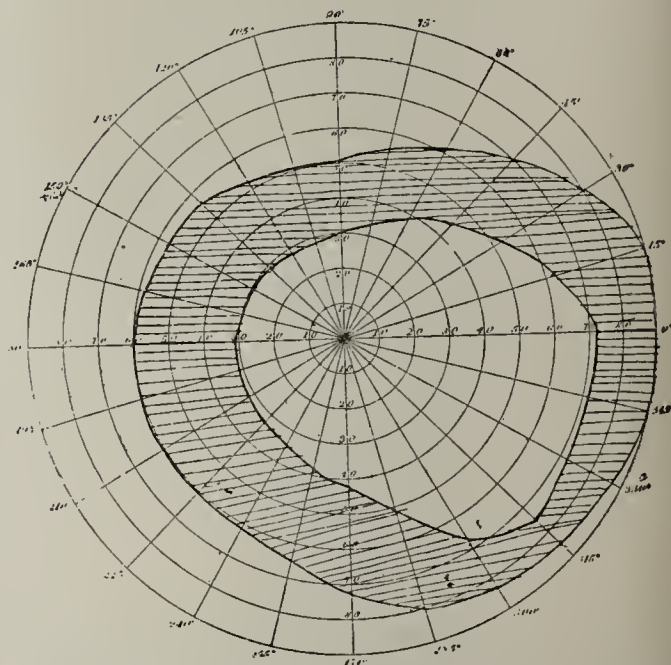
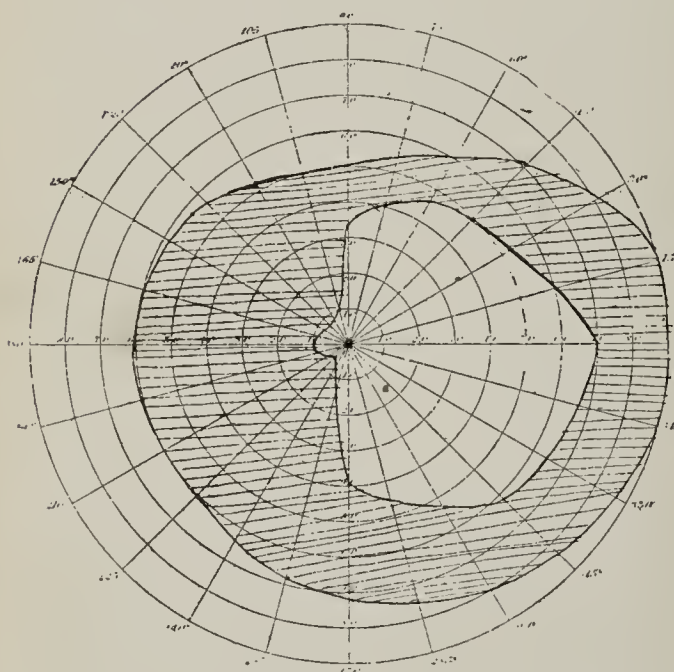
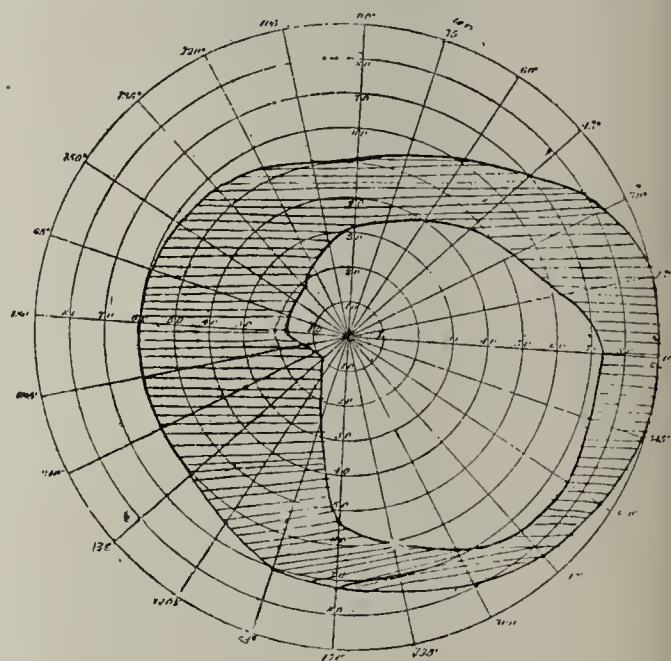
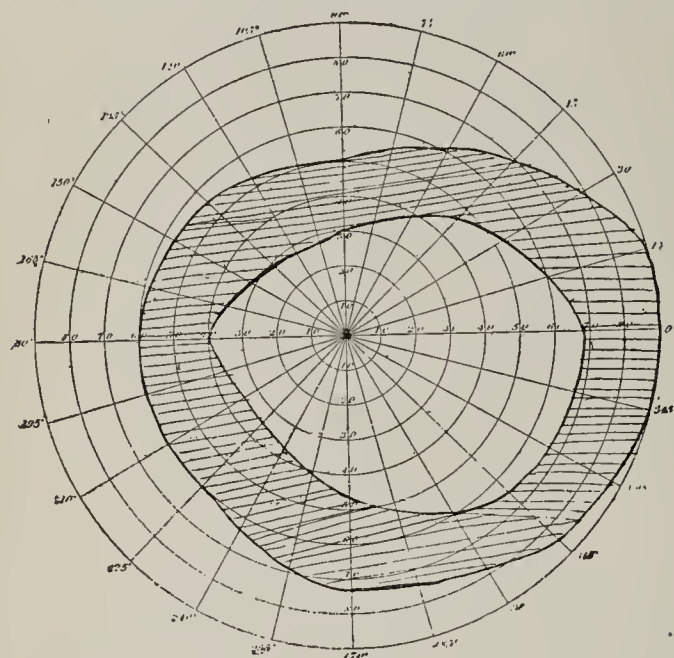
2. *Chronic Glaucoma; Numerous Subacute Attacks Occurring during the course of the Disease, with Diagrams of the Fields of Vision Illustrating the Effect of Eserine in Controlling these Exacerbations.*—Mrs. E., aged 50, an American by birth, came for treatment in September, 1888, complaining simply of dimness of vision in the right eye and inability to procure suitable glasses; headache and pain of any type was denied; the general health was perfect. The vision of the right eye was $\frac{15}{40}$; of the left $\frac{15}{30}$. In the right eye the cornea was slightly anæsthetic, the anterior chamber shallow, the disc round, excavated to its edges, especially deep above with an overhanging margin, beyond which and to the nasal side the papilla was surrounded by a buff-colored rim, in its turn encircled by a broad, halo-like band; T + 2; the iris was not atropic. In the left eye the anterior chamber was shallow, but no anæsthesia of the cornea; the disc oval, gray-red; a small, rather sharp, central excavation, not shelving; the veins full but not pulsating. The following results were procured by correction:

O. D. + 2.5 C + .65c axis $15\frac{1}{2}^{\circ}$. O. S. + 2.25s C + .65c axis H $\frac{1}{5}^{\circ}$.

This was given for constant wear and eserine,

gr. $\frac{1}{12}$ to the ounce, ordered, inasmuch as iridectomy was declined. The patient up to the present date has used this drug almost continuously, except on a few occasions, when a slight conjunctivitis appeared and it was discontinued or had substituted for it pilocarpine. She has had a number of attacks of subacute glaucoma, the vision sometimes sinking to $\frac{20}{60}$, the cornea becoming slightly steamy, distinctly anæsthetic, and the episcleral vessels coarsely injected, the tension rising to + 2 or 3. All operation has been systematically declined and in all instances

traction, the limitation producing a band of darkened area varying from 20 to 25 degrees in breadth, surrounding the preserved field of vision. Diagram II represents the field of vision on the day of one of the subacute attacks; eserine one quarter of a grain to the ounce was instilled every two or three hours. It will be observed that the field of vision under these circumstances assumes the type of a left lateral hemianopsia with concentric contraction of the preserved area. Diagram III represents the field of vision after twenty-hours' use of such eserine,



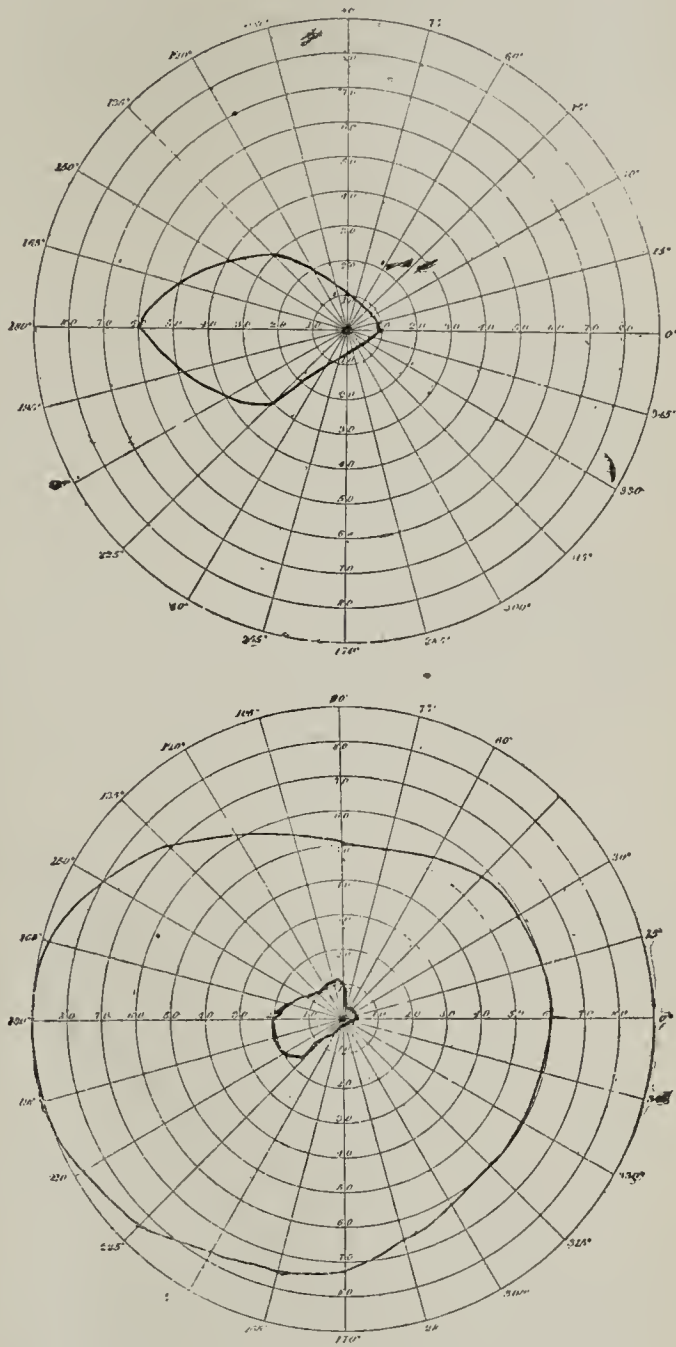
reasonable recovery has been produced by the use of eserine increased in strength and in frequency of application over and above what was continuously used. At present the best vision in the right eye is $\frac{20}{40}$; in the left eye $\frac{20}{60}$. Diagram I represents the field of vision as it was found at the original visit, September, 1888, and as it has remained almost exactly on all occasions except during the exacerbations. It will be observed that it is of that form known as a concentric con-

and it will be noted that the blind nasal area is beginning to contract, or, rather, that the preserved field is beginning to push its way into this blind area. Diagram IV represents the field of vision two days later, the eserine having been decreased to four times a day. After this the strength of the eserine was reduced again to one-twelfth of a grain to the ounce and used never less than twice a day. The visual field at the present time remains almost exactly as shown in

agram IV, or, in other words, about the same as it was two and one-half years ago, there being only a slight loss of less than ten degrees upon the nasal side. There have been a number of subacute attacks in all instances characterized by the symptoms just described, sinking of the vision, steaminess and anæsthesia of the cornea, increase in tension, rapid reduction of vision usually to $\frac{2}{40}$ and loss of the nasal half of the field, and in all instances the sequence of events has been about that which has just been described. It is proper to state that during the attacks full doses of chloroform were also used, and, as we know, this drug is credited with an influence upon increased intraocular tension, and that the patient has continuously taken either nux vomica or strychnia, but never in very full doses. The points of interest in this case are its long continuance without very great loss in vision, the frequent subacute attacks which have resulted in reasonable cure under the influence of eserine, the form which the fields of vision assume in one of these attacks, namely, that of almost complete left lateral hemianopsia, and which under the influence of the drug gradually widens out until the lost nasal field is restored, and the entire field practically assumes the same proportion which it had before the attack. In fact, as has just been shown at the last examination, about a month ago, in spite of some loss of the central vision ($\frac{2}{40}$ as compared with what at the original visit) the field is quite as large as it originally was, although not exactly of the same oval shape. The indication for eserine in this case is evidently very much more marked than in the one just reported, because in the first place more or less tension was always present, the anterior chamber was narrow, and in the second place during the exacerbations there was distinct increase in the intraocular tension. I cannot help believing that the eserine has been influential in preserving to this woman for more than two years the sight which she has.

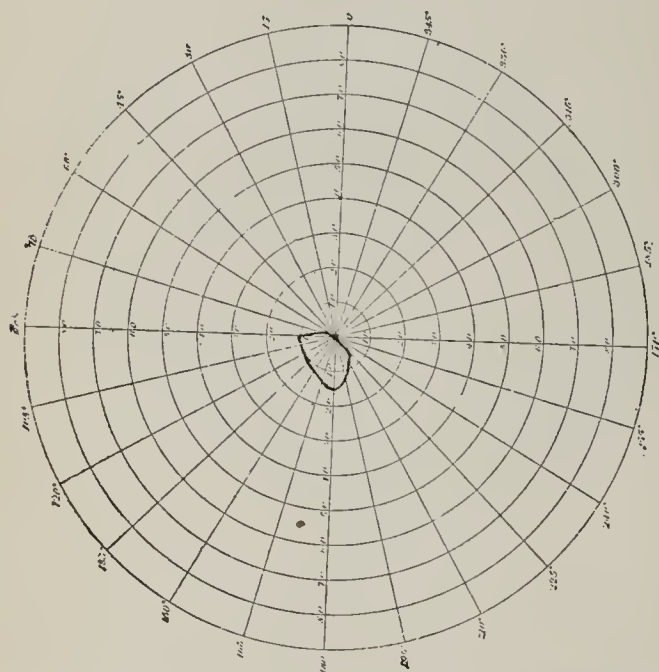
Case 3. Chronic Glaucoma; Steady Progress towards Blindness in Spite of Eserine and Full Doses of Strychnia; No Acute Attacks and No Pain.—James M., aged 60, of Irish birth, in January, 1890, began to notice before the one eye a spot which resembled the blue blossom on a blade of grass; he never had any iridescent vision nor was there pain or headache. He seems to have had no treatment for his eye until he came in September, 1890, or almost nine months later, when the following facts were ascertained: The dark spot no longer bothers him, but the vision is much depreciated; he is weak, somewhat nervous; has a chronic bronchitis; has used liquor frequently, of which the injection of the superficial capillaries in the nose and cheek give evidence. In the right eye the vision without correction was $\frac{2}{40}$; in the left eye $\frac{2}{60}$. In the right eye the pupil was prompt, the disc a horizontal

oval, gray, with a scleral ring all around, the edges slightly veiled; no excavation and the choroid woolly. In the left eye the pupil very sluggish and slightly larger than its fellow; an oval disc, a shallow glaucomatous cup, passing entirely to the edge, which is slightly greenish all around, and beyond a halo-like annular absorption band assuming a triangular shape above; the veins very tortuous, the choroid woolly and



disturbed; the tension distinctly +. The field of vision is represented in diagram I, showing practically entire loss of the nasal half, and a somewhat trowel-shaped preservation upon the temporal side. Eserine, a sixth of a grain to the ounce, was given, and the patient reported very irregularly, having declined operative interference. On January 19, 1891, the vision in the right eye was $\frac{2}{70}$ without correction, but with correction, namely, + 1. \odot +.90 axis $15\frac{2}{3}$; in the left eye $\frac{2}{60}$ barely. The field of vision is represented in diagram II, namely, entire loss of the nasal half and a very small irregular patch

of preservation upon the temporal side. Eserine or pilocarpine, the latter in twice the strength of the former, were used continuously, and the patient took sometimes iodide of potash and sometimes very full doses of strychnia. A month later the vision had declined to counting fingers at two feet, the lens showed numerous, fine dot-like opacities, and the dirty green color of the disc had increased. Still a month later the field of vision is represented in diagram II, a still further increase of the blind area having taken place, so that now only a patch fifteen degrees wide at its greatest diameter remains. Last month the condition was about the same, fingers



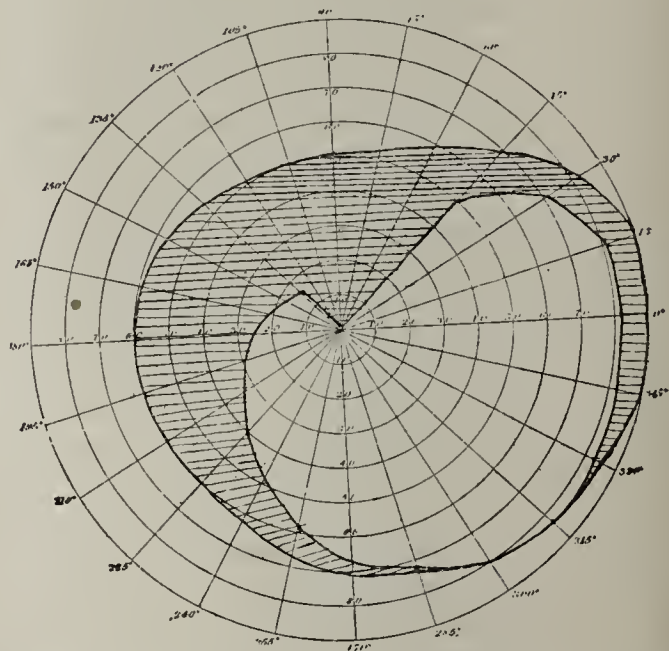
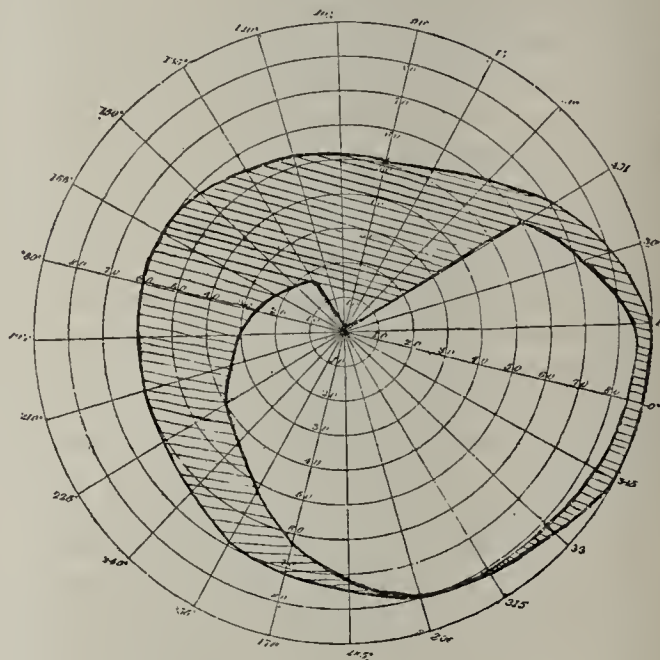
being counted eccentrically at about one foot. Thus far the right eye has not shown any glaucomatous signs, although he occasionally sees black spots in the field of vision. This is a good example of the steady progress of chronic glaucoma towards blindness in spite of medicinal treatment, and the fields of vision illustrate this well. Whether the process could have been stayed when the man first reported, in September, 1880, by an operation, it would be purely speculation to answer. Even at that time the contraction of the field of vision was dangerously close to the fixing point, and perhaps that unfortunate result which has followed iridectomy in cases of this kind would here also have occurred.

Case 4. Visual Fields Illustrating the Effect of Iridectomy in Simple Chronic Glaucoma.—Mrs. X., an American by birth, had passed her sixtieth year, and applied for treatment in June, 1889, complaining of loss of vision, especially in the upper portion of the field of the right eye, a frequent desire to change her reading glasses, dull aching pain in the eyeballs, and occasional neuralgia through the trigeminal distribution. The patient has chronic dyspepsia, is excessively nervous, and often the subject of insomnia. The

vision in each eye was $\frac{3}{4}0$; this rose by means of a correction as follows:

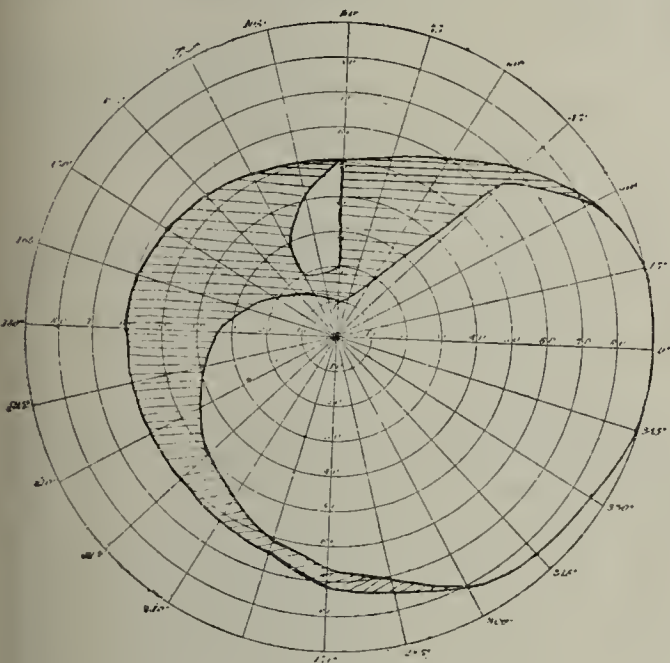
O. D. + .50 \odot + .50 axis 15 $\frac{2}{5}$. O. S. + .50 \odot + .50 axis 165 $\frac{2}{5}$.

The pupils were small and active, the anterior chamber shallow, the irides not atrophic. In the right eye the disc was a horizontal oval with a halo-like band surrounding it, and a complete shallow glaucomatous cup; pulsation of the vessels was readily induced by pressure. In the left



eye the disc was oval, its axis 105 degrees, a deeper but not quite complete excavation, and a broad band surrounding the papilla. In the right eye T. + 1; in the left eye T. + ?. The field of vision showed in the right eye somewhat concentric contraction and loss of the upper and inner quadrant; in the left eye slight peripheral contraction. The patient was fully corrected and put upon eserine in the usual dose. Frequent examinations of the fields of vision, as well as of the central vision, were made at short

intervals. Very little change took place for the worse until about the first of the year 1890, then, after a prolonged siege of nursing followed by a pretty sharp illness (bronchitis), there was marked depreciation of vision, which fell to $\frac{2}{50}$ in the right eye, but remained at $\frac{2}{20}$ in the left. Eserine and pilocarpine were alternately used, and iridectomy advised. This was declined, and the patient did not make up her mind to submit to operation until June, 1890. Then, as the vision again failed, a broad peripheral iridectomy by the upward section was made on the right eye. Diagram I represents the field of vision of the right eye nine days before the operation, a form which had varied very little during the entire course of the disease. Diagram II represents the first field of vision taken after the iridectomy was performed; that is, eighteen days subsequent to the operation, at which time the central vision was $\frac{2}{40}$ — and the astigmatism exactly doubled,



requiring now a + 1 cylinder with its axis at 15 or its correction. It will be noticed that the field is almost exactly the same as that taken nine days previous to the operation. Diagram II represents the field of vision in December, 1890, or almost exactly six months after the operation. It will be observed by comparing it with the other charts, that the preserved field has widened, that the area of lost vision is now occupied by an irregular triangular patch 30 degrees in its length, and varying from 5 to 30 degrees in its width, situated directly upward, like an island in the dark area. In this patch the patient appreciates the passing of an object without being able to distinguish its quality. Thus, a circle of white on a black background is simply appreciated as an object, not as a circle of white. The dark area no longer touches the fixing point above, but there is an area of about 10 degrees in which the vision has returned. The central vision is now $\frac{2}{40}$ full and $\frac{2}{30}$ partly. There has

been no increase in the glaucomatous process. I would note, then, as points of interest in this case, that the iridectomy checked the process, doubled the astigmatism, caused gradual but none the less distinct improvement in the visual field, with a corresponding improvement in the central vision, and finally, was the means of a partial restoration of perception in a previously entirely darkened area. It is proper to state that this patient has been taking almost continuously digitalis, nux vomica and strychnia, in the hope of increasing the circulation in the optic nerve and improving its function. It is quite possible that the good result may have been contributed to by these drugs.

DISCUSSION.

DR. EDWARD JACKSON reported a case of glaucoma of ten years' standing in which, about two months ago, there was a violent outbreak, the patient being a feeble old man, 90 years of age. He made a paracentesis and instilled eserine, and the pain disappeared and has remained so until now, with reduction of tension from + T. 3 to normal.

DR. G. A. ASHMAN called attention to the danger of deferring the operation too long by using eserine for temporary relief, and finally, when done, it is not satisfactory. Thinks bad results now are largely due to this fact. Eserine is only good in the beginning, and even then the effect is only temporary. Cases are rare where any permanent good effect comes from the use of eserine.

DR. EUGENE SMITH: I am in the habit of combining sclerotomy with the use of eserine or pilocarpine in treatment of all cases of chronic simple glaucoma. I make either simple sclerotomy after the method of Wecker, of Paris, or a double sclerotomy with two stop keratones—one in each hand—and I find better results when sclerotomy is combined with eserine, than with eserine alone.

DR. J. WALTER PARK, Harrisburg, Pa.: I can bear testimony to the remarks of Dr. de Schweinitz regarding the value of weak doses of eserine and pilocarpine in chronic glaucoma, having at present some cases under treatment bearing me out in what I say. During my stay at Mansfield Hospital, 1889, I observed with Dr. Morton and others cases of four years' standing of chronic glaucoma treated with weak doses of eserine, and which, in December, 1889, still had the same visual field. Iridectomies in chronic glaucomas were not followed by beneficial results, as a rule.

DR. RANDALL wished to emphasize the value of very weak solutions. Its success will often be as great as that of stronger solutions, and it is borne for many months without conjunctival irritation, although he had used it much in other conditions as well as glaucoma.

DR. S. C. AYRES only uses $\frac{1}{10}$ gr. of eserine to the ounce. Finds strong solutions harmful. He reported a case of glaucoma in which iridectomy was made in one eye and eserine used in the other, and after using eserine two and a half years, $\frac{1}{10}$ gr. to the ounce, the condition of the eye was such as to make the result quite satisfactory.

DR. DE SCHWEINITZ, in conclusion, said that he subscribed entirely to the doctrine that operation should be done in chronic progressive glaucoma, but eserine must occasionally be used temporarily, or when consent was lacking. He endorsed the value of weak solutions oftener, and the alternate use of eserine and pilocarpine. He referred to the physiological action of chloral upon intraocular tension.

DR. G. E. DE SCHWEINITZ referred to the difference of opinion existing in regard to the most satisfactory method of dealing with chronic glaucoma, and agreed with those surgeons who believe that it is proper to operate in cases of chronic progressive glaucoma after the patient has been properly warned in regard to the nature of the disease and the uncertainties which beset surgical interference. Inasmuch, however, as under certain circumstances it was impossible to operate owing to the lack of assent, the physiological action of eserine and pilocarpine on the eye was discussed, and a series of diagrams exhibited indicating the influence of these drugs upon chronic simple glaucoma. The first case was one of the simple variety of the disease, without sub acute attacks, and without any special rise in tension or alteration in the anterior portion of the eye. His charts showed gradual widening of the fields of vision in all particulars, so much so that there was a complete restoration of a previously lost portion of contraction being found upon the nasal side, which also had lessened. This patient was under observation for nearly a year. The chief interest attaching itself to the case was that there had never been any increase in tension, although the typical appearances of a glaucomatous disease were present in the eyeground and it seemed to demonstrate that even in the absence of decided elevation of intraocular tension, eserine has power to improve the nutrition of the eye and cause a restoration in a contracted field. In a second case of chronic glaucoma with numerous sub-acute attacks the points of interest were the long continuance of the disease two and one-half years, without very great loss of vision, the frequent subacute attacks which resulted in reasonable cure under the influence of eserine, the form which the fields of vision assumed in one of these attacks, namely, that of almost complete left lateral hemianopsia, which under the influence of the drug gradually widened out until the lost field was restored and the entire field assumed practically the same proportions which

it had before the attack. In a third case diagrams of the fields of vision were exhibited showing in spite of eserine the steady progress of chronic glaucoma towards blindness, until there was only a small patch about ten degrees wide remaining on the temporal side. The effect of iridectomy in simple chronic glaucoma when it yields a good result was graphically illustrated by a series of charts before and after iridectomy. The original loss of the field had been complete in the supero-nasal quadrant, while six months after the iridectomy the central vision remained as good if not a little better, than preceding the operation, while there was a gradual improvement in the visual field and a partial restoration or perception in a previously entirely darkened area. Incidentally Dr. de Schweinitz referred to the value of full doses of strychnia in temporarily controlling chronic glaucoma, and also spoke of the physiological action of chloral in full doses lessening intraocular tension, one of his cases having apparently been benefited in this way by the drug.

THE STATISTICS AND LESSONS OF FIFTY-SEVEN HUNDRED CASES OF REFRACTION.

Read in the Section of Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY GEORGE M. GOULD, M.D.,

OPHTHALMOLOGIST TO THE PHILADELPHIA HOSPITAL, PHILADELPHIA, PA.

As indicative of the tremendous importance of refraction in modern ophthalmic practice—at least in that of mine—I note that, in the time covered by my case-records, 93 per cent. of 1 cases has, according to my judgment, required correction of ametropia, while but 7 per cent. required treatment of diseases of the eye alone.

Comparison of my figures with those, *e.g.*, of European ophthalmologists, will hardly yield satisfactory results, because every case here included was tested with the patient's eyes under a mydriatic except where presbyopia was so advanced as to make the drug unnecessary.

The patients coming to the oculist are doubtless more frequently ametropic than people that do not come, and yet probably a very small percentage of the general community is emmetropic. Of all my patients, but four have been emmetropic—*i. e.*, about one fifth of one per cent.

As pointing to the disproportionate incidence of ametropic irritations and injuries among males and females, I find that 76 per cent. of my cases have been girls and women; but 24 per cent. boys and men. I take it that this is not to be construed as meaning that females are more frequently ametropic than males, or that the degree of ametropia is greater in degree. Part must be ascribed to the greater use by women of the eye

at near range demanded by their manner of life and occupation, part to their greater sensitive-ness of nervous organization, part to their les-sened resisting power, etc.

Twenty-four per cent. of all my cases have been presbyopes, but these corrections have been left entirely out of the present count.

In order to limit my statistics to refraction work alone, I have thrown out all cases in which there was intercurrent disease of the fundus or media of the eye that might violate the refraction result; all cases of aphakia; those with amblyo-pia not definitely connected with refraction; all in which systemic disease would possibly account for or change the refraction error. After thus setting aside such cases as these, I have remain-ing 2,866 eyes to form a basis of my study. The general results are shown in Table I.

TABLE I.—GENERAL REFRACTION OF 2,866 EYES.

Variety of Error.	Eyes.	Per Cent. of H.	Per Cent. of All.
Simple Hyperopia	373	17.	13.
Simple Hyperopic Astigmatism . . .	172	7.	6.
Hyperopia, with Astigmatism	1,680	76.	58.
Total Hyperopic	2,225	100.	77.
		Per Cent. of M.	
Simple Myopia	63	9.	2.2
Simple Myopic Astigmatism	79	12.	2.8
Myopia, with Astigmatism	509	79.	18.
Total Myopic	641	100.	23.0
Grand Total	2,866		100.0

Thus more than three-fourths of all my cases have been hyperopic, and of this number three-fourths have been also astigmatic. Relatively to its own group, the cases of simple hyperopia have been nearly twice as numerous in hyperopia as those of simple myopia in myopia; the percent-age being reversed in simple astigmatism; the percentage of each combined with astigmatism is almost identical. The tabulation of the hy-peropic cases, not including astigmatism, is given in Table II.

Thus more than one third of all hyperopes and one-fourth of all eyes had an error of 0.50 D. or less, and nearly two-thirds of all hyperopes and nearly one-half of all eyes had an error of 1 D. or less. I have found it wise to correct a large pro-portion of these small errors.

Comparison of the annexed Table III of myo-pic eyes shows the foreseen result — the greater incidence of high degrees in myopia. The de-grees above 5 D. are 17 times as numerous in myopia as in hyperopia. While 12.5 per cent. of hyperopes had an error above 2 D., 34.5 per cent. of myopes had the corresponding defect.

The percentages of each variety of astigmatism, arranged in groups, are given in Table IV.

Included in this table, without separation, are

TABLE II.—REFRACTION OF 2,053 HYPEROPIC EYES, AS-TIGMATISM NOT INCLUDED.

Degree.	Simple H.	H. plus Ah.	H. & H. plus Ah.	GROUPS.		
D.	Eyes.	Eyes.	Eyes.	Eyes.	Per Cent. of all H.	Per Cent. of all Eyes.
0.12	24	24	705	34.4	24.6
0.25	18	280	298			
0.37	9	86	95			
0.50	46	242	288			
0.62	13	110	123	633	30.9	22.
0.75	39	193	232			
0.87	14	43	57			
1.00	51	170	221			
1.12	8	8	283	13.7	10.
1.25	42	120	162			
1.50	29	84	113			
1.75	23	66	89			
2.00	27	55	82	171	8.3	6.
2.25	14	25	39	138	6.6	4.7
2.50	9	33	42			
2.75	8	18	26			
3.00	3	28	31			
3.25	1	12	13	70	3.4	2.5
3.50	8	15	23			
3.75	2	5	7			
4.00	7	20	27			
4.25	2	2	35	1.7	1.2
4.50	5	13	18			
5.00	3	12	15			
5.50	. . . .	6	6		
6.00	2	2	18	.8	.6
6.50	1	5	6			
7.00	1	3	4			
.	373	1,680	2,053				2,053	100.0	71.6

TABLE III.—REFRACTION OF 572 MYOPIC EYES—ASTIGMA-TISM NOT INCLUDED.

Degree.	Simple M.	M. plus Am.	M. & M. plus Am.	GROUPS.		
D.	Eyes	Eyes.	Eyes.	Eyes.	Per Cent. of all M.	Per Cent. of all Eyes.
0.12	8	8	229	40.0	8.0
0.25	3	125	128			
0.37	. . . . .	14	14		
0.50	10	69	79			
0.62	3	3	78	13.7	2.6
0.75	3	43	46			
0.87	. . . . .	1	1		
1.00	5	23	28			
1.25	3	18	21	38	6.6	1.3
1.50	1	16	17			
1.75	1	14	15			
2.00	4	11	15			
2.25	7	7	53	9.2	1.9
2.50	4	12	16			
2.75	3	8	11			
3.00	3	16	19			
3.50	3	11	14	30	5.3	1.1
4.00	2	14	16			
4.25	. . . . .	4	4		
4.50	. . . . .	12	12		
4.75	2	2	36	6.3	1.3
5.00	2	16	18			
5.50	2	11	13			
6.00	5	6	11			
6.50	5	5	78	13.7	2.7
7.00	. . . . .	8	8		
7.50	. . . . .	7	7		
8.00	1	5	6			
8.50	1	1	78	13.7	2.7
9.00	2	3	5			
10.00	3	6	9			
11.00	. . . . .	5	5		
12.00	1	1	78	13.7	2.7
13.00	. . . . .	1	1		
14.00	. . . . .	4	4		
15.00	2	. . .	2			
Total . . .	63	509	572	572	100.0	20.0

172 cases of simple hyperopic astigmatism and 79 cases of simple myopic astigmatism. There

are similarly included 57 cases of mixed astigmatism. The cases of simple hyperopic astigmatism, as compared with all cases of hyperopic astigmatism, are less than 10 per cent.; those of simple myopic astigmatism, as compared with all of myopic astigmatism, about 13 per cent. Low

TABLE IV.—REFRACTION OF 2,440 ASTIGMATIC EYES.

Degree.	Simple and Compound H. As.	Simple and Compound M. As.	Total H. As. and M. As.	H. As. Per Cent. of all H. As.	M. As. Per Cent. of all M. As.	Total As. Per Cent. of all As.
D.	Eyes.	Eyes.	Eyes.	Per Cent.	Per Cent.	Per Cent.
0.12	18	4	22	55.8	35.9	50.5
0.25	402	70	472			
0.37	225	45	270			
0.50	388	92	480			
0.62	111	26	137			
0.75	236	53	289	27.6	22.1	26.4
0.87	18	...	18			
1.00	146	51	197			
1.25	72	44	116	7.2	13.1	8.7
1.50	62	33	95			
1.75	27	34	61			
2.00	30	26	56	3.1	10.2	4.9
2.25	16	9	25			
2.50	20	22	42	3.6	8.6	4.9
2.75	13	5	18			
3.00	19	15	34			
3.25	8	8	16			
3.50	14	18	32	1.7	6.4	2.9
3.75	3	...	3			
4.00	6	12	18			
4.25	2	...	2	0.6	1.3	0.8
4.50	9	7	16			
5.00	3	5	8	0.4	2.4	0.9
5.50	1	1	2			
6.00	1	4	5			
6.50	...	1	1			
7.00	...	3	3			
10.00	2	...	2			
...	1,852 76 per ct.	538 24 per ct.	2,440	100.0	100.0	100.0

degrees of astigmatism of the hyperopic variety are relatively more numerous than of the myopic, whilst the high degrees are still more numerous in the myopic.
The axes of astigmatism are shown in Table V.

TABLE V.—AXES OF 2,440 ASTIGMATIC EYES.

Hyperopic.	Eyes.	Per Cent. of H. Axes.	Per Cent. of All Axes.
Axis 90°	953	51.4	39.0
Axis 180°	267	14.5	11.0
Symmetrical (not 90° or 180°)	292	15.8	12.4
Unsymmetrical	340	18.3	13.9
Total	1,852	100.0	...
Myopic.	Eyes.	Per Cent. of M. Axes.	Per Cent. of All Axes.
Axis 90°	90	15.2	3.7
Axis 180°	226	38.3	9.1
Symmetrical (not 90° or 180°)	104	18.1	4.1
Unsymmetrical	168	28.4	6.8
Total	588	100.0	100.0

As the question of symmetry and asymmetry is of much interest, I add another table, setting forth in further detail the 254 cases of non-symmetrical axes. Included in Table V are 40 cases (80 eyes), in which the axis of one eye was 90°, and of the other eye, 180°. Those cases in which

one axis was either 90° or 180°, and the axis of the fellow-eye neither 90° nor 180°, are, in Table V, included among the unsymmetrical axes, and further differentiated in Table VI.

TABLE VI.—UNSYMMETRICAL AXES—254 CASES.

Hyperopic.	Cases.	Per Cent. of Unsymmetrical H. Axes.	Per Cent. of all Unsymmetrical Axes.
One Axis 90°	70	41.2	27.6
One Axis 180°	25	14.7	9.8
Both Axes same (not 90° or 180°)	8	4.7	3.2
Sundry (not included in above)	67	39.4	26.4
Total	170	100.0	...
Myopic.		Per Cent. of Unsymmetrical M. Axes.	
One Axis 90°	9	10.7	3.6
One Axis 180°	32	38.0	12.3
Axes same (5-5, 10-10, 20-20)	3	3.5	1.2
Sundry (not included in above)	40	47.6	15.9
Total	84	100.0	100.0

In studying these cases of unsymmetrical axes I have been interested in trying to discover some law or tendency to a law to which they would conform. We know that in all hyperopic astigmatism the primary law is a tendency of the axis toward polarity at 90°. If we add to those cases where both axes are at 90°, those asymmetrical instances in which one axis only is at 90°, we get a total of 1,023 hyperopic eyes, or 55 per cent., with astigmatic axes at 90°. If to this number we add all the myopic axes at 90°, we have a total of 1,122, or 46 per cent. of all astigmatic eyes. In the same way the myopic axes find their preferential pole at 180°, and adding to these 226 symmetrical cases the 32 in which one axis is at 180°, we have a total of 258 eyes, or 42 per cent. of all myopic axes. Adding, again, the 267 symmetrical hyperopic axes at 180° and the 25 unsymmetrical, we have a total of 550 eyes or 22 per cent. of all astigmatic eyes, with the axis at 180°. Hyperopic axes are more apt to be at 90° than myopic axes are at 180° as 5 is to 4, *i. e.*, they are 20 per cent. more frequent; and any axis of astigmatism whatsoever is more than twice as liable to be at 90° as it is to be at 180°, the proportion being as 46 is to 22. Over two-thirds (68 per cent.) of all astigmatic eyes have their axes either at 90° or 180°. It is also seen that there is a much greater tendency to unsymmetrical axes in myopia than in hyperopia, the ratio being as 28 is to 18, or 65 per cent.

Can we find any law governing the unsymmetrical axes? Both the hyperopic and myopic varieties appear to be similarly lawless. Take the hyperopic class: In 25 cases with one axis at 180° there are six instances where the fellow axis is twice alike, the remaining 19 being all different one from another. In 70 cases of asymmetry where one axis is 90°, there are 10 cases of

$\frac{5}{0}$ (or $\frac{90}{5}$), 9 of $\frac{90}{0}$ (or $\frac{60}{0}$), 6 of $\frac{110}{0}$ (or $\frac{90}{110}$), 6 of $\frac{40}{105}$ (or $\frac{105}{90}$), 6 of $\frac{70}{90}$, 5 of $\frac{65}{90}$, the rest being well scattered in groups of one, two or three of kind. The entire remainder of asymmetrical cases will not as well submit to any law, order or grouping that I am able to discover. The only approximation to such a law consists in the fact that if but one axis can be brought into coincidence with either major pole, the fellow axis is decidedly repelled away from it. In the 70 cases of asymmetry where one axis was 90° , the other was within 5° of the same in only two cases. Possibly personal negligence may in part account for this. When one axis is within 5° or 10° of one of the major poles, we are very prone to call 90° or 180° . Within the past year I have by experience learned the importance of scrupulous exactness in this respect, and have devised a mechanical aid helping to detect these slight differences with care and certainty. Bearing still farther upon the question, I add that in 36 cases of ordinary asymmetrical hyperopic astigmatism, neither axis being at 90° or 180° , I have found that 13 cases were but 5° out of symmetry, 13 but 10° out, 10, 15° out, etc. It remains an open question whether this striking difference from the cases above alluded to, where one axis was 90° or 180° , is due to my greater care, and unconscious freedom from a prepossession, in accurately locating the *unusual* axis, or to some hidden and different law. I may also add that in the 70 and 36 cases where one axis was at 90° or 180° , there was a decided and clearly marked *disinclination* of the fellow axes to cluster about or tend toward either major pole. The hyperopic axes fly from the 90° pole a little less decidedly than the myopic axes fly from the 180° pole. This would nearly argue against the personal equation or negligence theory. I should also say that the cases of symmetrical axes other than those of 90° or 180° likewise show no well-marked tendency to fall into groups or suggest any governing law.

Before leaving the subject, I wish to ask my colleagues if they have found any undoubted instances of a change in the axis of astigmatism caused by the use of the mydriatic. I have had several such cases, the patient, after the return of the accommodation, emphatically refusing the axis as clearly demanded under the mydriatic. In two most troublesome cases contradicted each other as to whether the mydriatic or non-mydriatic eyes were the better. Both were cases of unsymmetrical axes, and of compound hyperopic astigmatism. One, under the drug, demanded the axis 37 D.) at 105° (the fellow being at 90°), and with functional accommodation would have it at 60° . I gave it at 60° , but in two months grievous pain in the eye, and chorea of the side of the face, forced me to return to the mydriatic axis, with sudden cessation of the ocular pain and

facial spasm. The other case, under the mydriatic, demanded the axis (1.50 D.) at 150° , the fellow being at 180° . This I ordered, but found soon afterward that axis 105° was desired by the functional accommodation, and this has now been worn for a year or more with perfect satisfaction. The fact has led me to scrutinize most carefully those cases in which correction of the ametropia does not relieve the symptoms. It is also pertinent to inquire if in some cases, soon after applying the glasses, the relief at first experienced, but soon ceasing, may not be due to a refractive change following and a direct reaction of the eye, its innervation, etc., to the glasses themselves.

The records of insufficiency here grouped together are based solely upon the 20-foot tests.

TABLE VII.—MUSCULAR INEQUILIBRIUM AND HYPEROPIC REFRACTION.

ESOPHORIA.

Degree.	Cases.	Per Cent. of H. Esophoria.	Per Cent. of All Esophoria.	Per Cent. of All Hyperopia.
1	98	29.0	25.2	8.8
2	100	29.5	25.7	9.0
3	58	16.2	15.0	5.2
4	36	10.2	9.2	3.2
5	16	4.5	4.1	1.6
6	8	2.2	2.0	.8
7	3	.8	.7	.3
8	10	2.8	2.5	.9
9	2	.5	.5	
10	6	1.7	1.5	
12	4	1.0	1.0	
14	2	.5	.5	
15	1	.2	.2	1.6
16	1	.2	.2	
18	2	.5	.5	
20	1	.2	.2	
.....	348	100.0	89.0	31.4

EXOPHORIA.

Degree.	Cases.	Per Cent. of H. Exophoria.	Per Cent. of All Exophoria.	Per Cent. of All Hyperopia.
1	55	35.9	28.0	4.9
2	33	21.5	17.0	2.9
3	25	16.3	13.0	2.2
4	17	11.2	8.0	1.5
5	8	5.2	4.0	.8
6	3	1.9		
8	3	1.9		
9	2	1.4		
10	4	2.6	7.0	1.3
12	1	.7		
15	1	.7		
18	1	.7		
.....	153	100.0	77.0	13.6

According to my table, 89 per cent. of all esophorias were connected with hyperopia of some kind, but that 77 per cent. of all esophorias are likewise connected with hyperopia, is noteworthy. In myopia the percentage of esophoria and exophoria is the same, and the esophoria of hyperopia is but little more than twice as high as the exophoria. It seems to me we are far from a satisfactory theory of the etiology of these conditions. Clinically I have been struck by the fact that very often a high degree of exophoria, and even somewhat often of esophoria, may be ignored without any resultant symptoms, local or

reflex. I have also found that the symptoms frequently bear no sort of relation to the degree or kind of heteropia. As regards treatment, the rule I have come to follow is to correct by prisms the internal insufficiency when above one degree and certain that it is permanent, particularly if the patient be a hard-worker at near-range. When the interni are as weak as 12° I advise tenotomy. In external insufficiency, I am greatly inclined to trust the ametropic correction alone, and certainly if no pronounced reflex symptoms exist. Experience has constantly shown me this is a good rule to follow. I remember many cases, but especially one, a woman of 30 who had never worn glasses and who usually had a positive squint of the left eye. For two years the eye keeps straight when the non-prismatic spectacles are worn, and without any reflex symptoms.

TABLE VIII.—MUSCULAR INEQUILIBRIUM AND MYOPIC REFRACTION.
ESOPHORIA.

Degree.	Cases.	Per Cent. of Myopic Esophoria.	Per Cent. of All Esophoria.	Per Cent. of All Myopia.
1	11	27.	2.8	3.4
2	12	29.	3.1	3.8
3	5	12.	1.3	1.6
5	4	10.	1.1	1.2
6	4	10.	1.1	1.2
8	2	5.	.5	.6
10	1	7.	.7	1.0
16	1			
20	1			
.....	41	100.0	10.6	12.8

EXOPHORIA.

Degree.	Cases.	Per Cent. of Myopic Exophoria.	Per Cent. of All Exophoria.	Per Cent. of All Myopia.
1	1	2.	.5	.3
2	15	34.	7.6	4.5
3	11	25.	5.5	3.4
4	7	16.	3.5	2.2
5	2	4.	1.0	.6
6	2	19.	4.	2.0
9	1			
10	3			
15	1			
18	1			
.....	44	100.0	22.0	13.0

Remove the glasses and the eye rolls inward at once. She had a high degree of compound hyperopic astigmatism, the left eye requiring a cylinder 2.25 D. stronger than its fellow.

I have had a number of patients in whom, at the first examination, there was a demonstrated inefficiency of a few degrees, but who within a short time after wearing ametropic and prismatic correction were found to have a progressive weakness of the muscle. The symptoms demand attention: with increase of the prisms temporary relief is obtained, but in a month or several still greater increase of the prism is demanded. It looks to the patient as if the spectacles were making matters worse. One case ran from 6° to 16° within a year. I cut the tendon

and reduced the muscular balance to equilibrium, and am now wondering if the road is to be again traveled all over. What is taking place in these muscles? To say "spasm" seems like a *confessio ignorantiae*. I always feel like exclaiming, "Bosh!" whenever spasm of any ocular muscle is mentioned.

During the time covered by these statistics I have had 8 cases of convergent and 2 of divergent strabismus, not included in the tables.

Turning to hyperphoria, I have had 20 cases: 8 of 1°, 4 of 2°, 3 of 4°, 1 of 6°, 1 of 7°, and 1 of 8°. Among these was one case of right monolateral partial ptosis in which persistent and powerful effort to raise the upper lid had wrinkled and arched the brow and forehead to a remarkable degree. The head was canted to one side and backward, and the inferior rectus of the eye had naturally become over strong. Correcting lenses, 1.50 D. cylinder with a base of prism in the right, not only relieved the distress, but has quite cured the ptosis, which, therefore, seems to have been of a reflex nature. The changed appearance of the man and his power to raise the lid is a great cause of congratulation by all his friends. I have usually corrected hyperphoria with prisms and with success. The case with 8° is an anomalous one. She has never had any severe reflex symptoms either before or since getting glasses. She had a high compound myopic astigmatism, with amblyopia, and with 4° of esophoria. With the visual axis horizontal there was diplopia corrected by a prism 6° or 8° base down in the left. But upon looking downward the diplopia disappeared, without the prism, or was reproduced by it. There was no history of traumatism. Six months after correcting her ametropia and esophoria, the hyperphoria without correction, had reduced itself to 3°, and no reflex symptoms exist. The case I have classed as 7° ranged from 6° to 10° on different days, but was usually about 7°. This prism while correcting the hyperphoria, with the axis of vision horizontal, and accurately facing the object, at once produced diplopia and distress with movements of the eyes, or in walking and looking about. The patient's health was so profoundly bad that I did nothing for the hyperphoria. She was a presbyope, 1.25 D., with a very small degree of myopia. In the past five months she is, under general treatment, improving rapidly in general health, and the ocular symptoms are disappearing. The patient with 6° of hyperphoria could wear for permanent use only a 4° prism, though the test clearly showed 6°. With the 4° prism he has perfect relief and satisfaction. The cases with 4° or less wear the prismatic correction with entire satisfaction.

Speaking generally, then, my experience leads me to correct all hyperphorias of 4° or less, and

most esophorias of more than 1° with prisms; to ignore exophoria until (very rarely) forced to consider it, after the patient has worn the ametropic correction for a considerable time; to perform tenotomy in decided strabismus, and then only after having worn ametropic correction for a time, and if possible with atropine in the non-squinting eye; to perform tenotomy in insufficiency, only when of 12° or over, and when accompanied by decided reflex symptoms. I have never had a case of imbalance of the muscles without an ametropia demanding correction. It is only in such a mythical case that I might perhaps be prevailed upon to consider the remote possible advisability of beginning to think of commencing the study of graduated tenotomy!

Forty-four of my cases, 3 per cent. of all, have had the same refraction error in both eyes. As to anisometropia, I have never found a difference between the two eyes so great that the proper refraction of each eye was not borne in combined action. The greatest differences I have found were from 4 D. to 9 D. in sphericals, and 4 D. to 6.50 D. in cylinders.

One of the highest hyperopic errors with retained acuity was + sph. 6.00 D. \ominus + cyl. 4.00 D. I think the highest simple hyperopic astigmatism was, R., + cyl. 6.00 D. ax. 95° , L., + cyl. 4.50 D. ax. 85° . To this a presbyopic correction of 3.00 D. was added in improved bifocal lenses, the result being all that could be desired. I have never prescribed a myopic lens greater than 15.00 D., though I have had patients whose absolute myopia was greater. The case of double hyperopic astigmatism of 10.00 D. was certainly as high as that, though there was great amblyopia. Besides the frightful astigmatism, he had 5.00 D. of hyperopia. He was, of course, unable to read, and was quite dull of intellect. He was a sailor, and not allowed to wear glasses. One wonders how he could have done his work at all. As an instance of complicated defect, a physician and friend of mine is now wearing with great satisfaction:

O.D., — sph. 7.00 D. \ominus — cyl. 1.00 D. ax. 45° ; O.S., — sph. 7.75 D. \ominus — cyl. 1.00 D. ax. 135° ; prism 5° each eye, base in; prism 2° left, base up; prism 2° right, base down.

A word as to full correction. The advocates of this theory say we must aim to put the eye in an emmetropic condition; this is the ideal we seek to bring about or approximate. I deny the major premise *in toto*. The *wherefore* is logical if the *whereas* be allowed. I cannot allow it; and for the following reasons:

1. The *history* of the pair of eyes we are prescribing for is often, and generally, one of abnormal use or abuse long continued. The eye, from its very history, is in an abnormal condition, and cannot be proceeded with as if normally or physiologically reacting.

2. Long excess, deficiency or abnormalism of function has begotten organic changes in the eye and its innervation mechanism. In hyperopia the ciliary muscle is abnormally developed or hypertrophied, in myopia correspondingly weakened and undeveloped, in astigmatism unphysiologically developed. These organic and functional changes cannot be neutralized quickly, and will continue to mar the results of all cast-iron rules, and for a time dependent upon the length of evolution of the defect, the peculiarities of the reaction, the vital forces, the temperament, etc.

3. The work these eyes has to do is so far from ideal, so variant and abnormal, that abstract rules will not apply. Every case is a law unto itself. Civilization crushes ocular ideals as brutally and ruthlessly as psychical ones. Sewing girls, book-keepers, literary people, etc., who must work at near range from twelve to sixteen hours a day, cannot have much receptiveness for ideals and abstract rules.

Many other reasons conspire to lead me to lend no ear to such advice. Sometimes I over-correct hyperopia; sometimes aim at artificial emmetropia; usually I under-correct all defects except astigmatism. I believe the bitterest of errors is to fully correct myopia. I might do it in a farmer, but in an urban liver, never. So long as one does it, I believe many of his patients will be the worse for the service, and finally drift into other hands. Nearly all patients I have had who have previously been much under the care of others, have been examples of full correction. Selfishly, it is a good plan for us to advise others. It is like virtue, we all believe in it—for others! In myopia it. (over-correction, not virtue!) puts the weakened ciliary muscle to a strain the equivalent of an irritating hyperopia of a degree corresponding to the size of the error, the length of its continuance, the reacting quality of the organism and the amount of near work to be done. In hyperopia, the hypertrophied ciliary muscle will refuse inaction, or even a partial deprivation of its accustomed work, for months, and if of long evolution, for years. In astigmatism, the reaction comes very promptly, owing to its predominant nervous or functional nature, and I find that full correction is usually borne satisfactorily, though exceptions occur even here.

Instead of aiming at an ideal of emmetropia, I find I am commonly aiming at an ideal of slight myopia, varying in degree from 0.37 to 2 D. in myopia, and from 0.12 to 0.75 D. in hyperopia. In a myope this can be instituted at once, but in a hyperope never at once (unless it be for near work), but often in the course of time, or by means of a second pair of lenses for near work, though presbyopia proper is a long way off.

The abridged records of a few peculiar or instructive cases may not be uninteresting to refractionists:

1. Miss S., aged 54, an intelligent city lady, has never worn glasses, and *has never had a headache*. She was found to require the following correction:

O.D., + sph. 0.62 D. \odot + cyl. 2.75 D. ax. 6°; O.S., + sph. 0.62 D. \odot + cyl. 3.25 D. ax. 120°. Esophoria 1°, and presbyopia.

2. A child of 7, for the past 3½ years has had "spasms," the number averaging about fifteen a week. Has also screaming or crying spells lasting sometimes for one or two days. Would not permit examination of the eyes. With paralysis of the accommodation by atropine the spasms have ceased for 2½ months, except three attacks, two of which followed neglect of the drops in the eyes.

3. Miss K., aged 30; headaches at vertex all life; growing worse of late; sick at stomach for 24 hours after riding in cars. A life of misery, fainting fits, subjective visions, nightmare, weariness of life, and latterly symptoms of mental disorder. Refraction:

O. D. + sph. 2.00 D. \odot + cyl. 1.50 D. ax. 80°. O. S. + sph. 3.25 D. \odot + cyl. 1.25 D. ax. 115°. No heterophoria.

The distressing symptoms disappeared almost entirely and at once upon getting spectacles, and for the past year she continues a healthy, happy grateful woman.

4. F. M., prior to a severe attack of monocular herpes zoster ophthalmicus was nearly emmetropic. After recovery from the inflammation the affected eye required—sph. 1.25 D., \odot + cyl. 3.75 D. ax. 180°. The other eye remains unchanged and perfect acuity exists in both.

5. Professor J., requires for one eye—cyl. 4.50 D. ax. 175° \odot + cyl. 4.50 D. ax. 32°, with which he has perfect acuity the fellow-eye taking—sph. 2.25 D. \odot — cyl. 2.75 D. ax. 60°.

6. Miss McC., has had intense frontal and then occipital headaches the past four years, with distressing sleepiness most all the time, and with great anorexia. There was immediate relief of all symptoms by:

O. D., cyl. 2.75 D., ax. 150° \odot + cyl. 1.00 D. ax. 80°. O. S., cyl. 2.75 D. ax. 20°, \odot + cyl. 1.00 D. ax. 105°.

7. Mr. T., had headaches at base of brain and sick-headaches for 45 years. Has taken a "cart-load of medicine;" has been cupped and leeches and "electric-battered" all his life, his neck being a mass of scars. No physician ever said "eyes" to him. He has only a low degree of compound hyperopic astigmatism, but as usual in such cases, at unsymmetrical axis. Correction of this and presbyopia, with unexpected quickness stopped his sufferings within a month.

8. Mrs. M., aged 26, had headache for 11 years, [frontal for 9, occipital for past 2 years]. At the rhythmic crisis of headache there is great numbness of the left side of the face, tongue, arm and

trunk, the anæsthesia preceded by blindness of the left eye, things appearing to dance. Pain in the left eye then supervenes, and vomiting follows. The anæsthesia lasts about ten minutes. The attacks occurred about once a month but not connected with menstruation. After correcting a slight hyperopic astigmatism at unsymmetrical axis the attacks were at once transferred to the right side of the body, changed in character, lessened in violence and have now about entirely subsided.

9. Mr. P., has for 18 years had constant severe "colds" the whole winter long. The coryza was vaguely connected with ocular irritation, lachrymation, etc. He has never worn glasses until last summer. He has a high degree of compound myopic astigmatism at unsymmetrical axis and six degrees of esophoria. There is no doubt in his mind as to the influence of his spectacles in making him entirely free from any cold the past winter.

10. An obstinate case of vernal conjunctivitis or Frühlingskatarrh, disappeared at once with correction of the ametropia.

11. Mrs. O'C., aged 32, looking as if 50, has had brutal frontal headaches for 17 years. The back part of the head is tender to the touch. Often has "blind-spells," and an abnormal appetite not satisfied by food. Forehead and eyebrows burn and as she avers, *bleed!* Says the bleeding is not from scratching or injury. Requires:

R. —sph. 9.00 D., \odot — cyl. 3.00 D., ax. 135°. L. —sph. 7.00 D., \odot — cyl. 2.00 D. ax. 75°. Has been wearing simple spherical lenses alike in both eyes from a prominent hospital.

12. R. + cyl. 4.50 D. ax. 90° \odot — cyl. 1.25 D. ax. 180°. L. + cyl. 3.50 D. ax. 90° \odot — cyl. 3.00 D. ax. 175°. The last cylinder put at 180° could not be worn.

13. A prominent oculist of a distant city prescribed without a mydriatic:

O. D. + cyl. 0.25 D. ax. 90°. O. S. + cyl. 1.35 D. ax. 90° \odot — cyl. 2.00 D. ax. 180°. By the aid of a mydriatic I find the true refraction:

O. D. + sph. 1.00 D. O. S. + cyl. 2.25 D. ax. 105° \odot — cyl. 2.00 D. ax. 15°. The headache continued with the former glasses, stopped with the latter.

14. Mr. W., wearing for high myopia, a full, or an over-correction, for constant and much near use, with severe reflex symptoms ocular and systemic. I reduced the correction from 6.75 D. to 4.50 D., impairing, of course, the distant vision immensely. Immediate cessation of the symptoms followed and in two months a recovery of the normal acuteness. The old glasses cannot now be worn five minutes.

15. W. K., dyspepsia and diffuse headache for 4 years. Sick-headache, vomiting, etc., two and three times a week. Often faints in street. Past

three months headache only at vertex. Weight reduced from 194 to 140 lbs. Has consulted the best and many physicians. Has taken every drug, and done everything could be thought of. Has a defect, the most certain to work mischief of any—a typical health-wrecker:

O. D. + sph. 0.62 D., \ominus + cyl. 0.62 D. ax. 180° O. S. + sph. 1.00 D. \ominus + cyl. 0.37 D. ax. 45°

16. J. Y., had for 10 years had 40 to 50 attacks a day of great dizziness. Had always to ride with closed eyes, as walking a short distance, looking upward, or downward, etc., brought on an attack. Had typical agoraphobia. Cured entirely for past year by:

R. — sph. 0.75 D \ominus — cyl. 1.00 D. ax. 90°. L. — cyl. 3.00 D. ax. 30° \ominus + cyl. 3.50 D. ax. 120°.

The last case but one leads me to a word as to the sort of ocular defect that is most injurious to the nervous system. The least harmful is simple myopia, so long as only of a moderate degree and without great anisometropia. I have never had such a case with any reflex symptoms. Simple hyperopia if nearly alike in both eyes will often set up no irritation in the non-sensitive and out-of-door living, but may bring trouble to the over-worked and nervous type. Anisometropia will produce disorder unless one eye be discarded. I would place simple and compound symmetrical myopic astigmatism next in the heirarchy, and then the same defect in hyperopia. High degrees of symmetrical astigmatism are often free from very bad results, and they are not productive of amblyopia. Compound hyperopic astigmatism if nearly alike in the two eyes, and especially if of high degree and symmetrical, will sometimes be borne unexpectedly well; add anisometropia and suffering is almost certain. But the very acme of torment is from a medium low degree of compound hyperopic or myopic astigmatism, each differing in quantity in the two eyes, with unsymmetrical axes and with preserved desire or ability of binocular vision. There is no nervous system can resist ruin under such circumstances. Asymmetry of axes, anisometropia and preserved desire for binocular vision is a diabolic combination that has wrecked many a life.

I have found it an anomalous fact, one usually not conforming to physiological laws, that, with ocular irritation, the reflex does not as a rule return to the eyes but is commonly inhibited, resulting in headache and cerebral abnormalism, or is derouted, resulting in reflex neuroses. I have elsewhere tried to explain this fact.¹ Classing together all the reflexes that may be called ocular in result, that *do* return physiologically to the eye, I find the following: (See Table 9.)

There is one symptom and consequence of eye-

TABLE IX.—EYE-STRAIN, WITH OCULAR REFLEXES.

Symptom.	Cases.	Per Cent. of all Refrac. Cases.
Pain in the Eyeballs or Orbits	161	11.0
Photophobia	15	1.0
Blepharospasm	11	1.0
Blepharitis, Styes, etc.	21	2.0
Partial Ptosis	2	...
Conjunctivitis excluded except in	15	1.0
Lachrymation, Epiphora, etc.	20	2.0
	245	17.0

strain that I have omitted to mention because it required especial explanation: I have named it ametropic choroido-retinitis. I have urged it upon the notice of the profession because I grow more assured that however much subsequent observation by others may modify the clinical and etiological features I have pointed out, there will still remain a great significance and an inexpugnable residuum of truth in my contention. Stated in general terms I find that the cause of eye-strain, *i.e.*, abnormalism of the image-focalization and position, is also the cause of macular abnormality or disease. When the untrue focalization or position is within the strained power of the compensatory mechanism, to neutralize the fact of eye-strain with its infinite variety of symptoms is patently present and the all-important fact. When the compensatory apparatus is unable to neutralize completely or habitually, there will in time, and in the great majority of cases, arise an unnatural condition of the macular or fovea, evidenced objectively by local abnormalism of pigmentation or coloring, and subjectively by subnormal acuity in advanced cases or by disproportionately lessened response to reduce illumination. The ultimate condition of advanced cases is commonly called central choroiditis. The phenomena has nothing in common with "drag," "conus," or other nerve-head, or mechanical changes in stretching globes—except that a common cause often precedes both. It is difficult to examine the macula, and the pigmentary changes are usually so slight that these are naturally overlooked and hence an excusable though sometimes amusing skepticism. The symptom of disproportionately lessened retinal reaction to lessened illumination seems to me of great value and significance. It is essentially one with the commonest symptom of all eye-strain patients—sleepiness in near-work by artificial light. The transmutation of an imperfect image or æther-waves by the retina, into a series of neural impulses, is a severe labor, and produces abnormalism of the peripheral or retinal end-organ at the point of greatest impact and labor. Unphysiological stimulus always necessitates abnormal changes in the recipient mechanism. Hence the retinal injury. The brain has a still severer labor to manufacture out of the in-

¹ "The Influence of Sexualism in Reflex Ocular Neuroses," Med. and Sur. Rep., March 9, 1889.

sufficient and non-representative retinal stimuli an effective sensation, and to form judgments that shall complete and compensate the misrepresenting image.

Severe labor tires, and the exhaustion of the cerebral mechanism is evidenced by sleepiness. I think 90 per cent. of the eye-strain patients will have the symptoms and wonder how you know about it.

On account of the duplication of symptoms and the indefiniteness both of diagnosis and result that necessarily attends such conditions, it will be understood that the figures of the table of reflex ocular neuroses can in some ways and parts have only a low relative value. But something is gained by grouping them together. Many of the symptoms were probably of extra-ocular origin. All that is implied in the grouping is that the symptoms were often, if not in the majority of cases, of ocular origin. Different classes vary in the certainty with which one may say that they *did* so arise, and many require time to explain my reasons for the ascription. Some are directly, others only secondarily due to the ocular irritation.

TABLE X.—REFLEX NEUROSES OF POSSIBLE OCULAR ORIGIN.

Symptom.	Cases.	Per Cent. of all Reflex N.	Per Cent. of Refrac. Cases.
Headaches, sundry types	833	66.7	58.1
Digestive and Assimilative Disorders	277	22.2	19.3
Mental Symptoms, Melancholia, Memory, etc.	8		
Night Terr rs, great Insomnia	33	2.7	2.3
Chorea, and Choreic Symptoms	15	1.2	1.
Morbid "Nervousness"	26	2.0	1.8
Trembling	11		
"Blind Spells"	9		
Anæsthesia	3		
Menstrual Troubles	7		
Odontalgia	1		
Aphonia	1		
Tinnitus Aurium	2		
Sinking or Fainting Attacks	8		
Stuttering	1		
Localized Spots of Pain	6		
Sundry	8		
	1,249		87.1

TABLE XI.—HEADACHE.

Variety.	Cases.	Per Cent. of all Headache.	Per Cent. of all Refrac. Cases.
Frontal—Brows, Temple	524	63.	36.5
Sick-Headaches	73	9.	5.1
Severe "Neuralgia"	38	4.	2.7
Primarily Frontal, extending to Vertex	15	2.	1.0
Primarily Frontal, extending to Occiput	29	3.	2.0
Primarily Frontal, then diffused	34	4.	2.4
Vertex alone	12	2.	.8
Occiput alone	16	2.	1.1
Diffused or general	53	6.	3.7
Giddiness or dizziness	39	5.	2.7
Total	833	100.	58.0

The only overstatement is in the duplication of symptoms arising from the fact that often these patients have several of the symptoms. This

overstatement, however, will but partially neutralize the understatement of failing, in the hurry of practice, to elicit or get down on paper the details of symptoms. I have had no Hahnemanian symptom, microscope or kaleidoscope, and I hope I value truth more than a specialist's special pleading.

As to headache, its significance is not recognized because its death-bringing power is so slowly operative, and because it finally employs other diseases to do its work. But it cannot be forgotten that if the brain is the highest seat and center of vital and regulative life, its paining must mean destructive or harmful activity for all the vital powers. Careful clinicians will assent to this. Furthermore, it must arouse the most sluggish, if it be also true that certainly three-fourths of all headache are due to eye-strain. If you think 90 per cent. I shall not disagree. I am quite sure that over 75 per cent. of all my patients have had headache, though I find but 58 per cent. reported in my table. What proportion have been cured, or so greatly benefited as to be called a cure? Certainly 95 per cent. or more. As to sick headache, I believe it due to eye-strain in 90 or 95 per cent. of cases. Compare the opinion of that veteran neurologist, Seguin.² Sometimes it is not quickly, sometimes not even at all curable after 30 or 40 years of habit and disordered function of the nervous system. Habit becomes structure in time. Function makes its tools and we call them organs. Swim long enough with your hand and you will surely be web-fingered by and by. But sometimes the system resists these changes and preserves the ability to throw off long habit very quickly. Let me cite the case of my friend, Dr. Larcier, of Bethlehem, Pa., aged 32. He had had sick headaches twice a week for over 20 years, each attack culminating in violent emesis, exhaustion and sleep, the whole attack lasting about 24 hours. Seven months ago I prescribed for him an one-half dioptric cylinder in the right eye and an one-fourth in the left, both at axes 90° Since then he has had three attacks, twice when he broke and was without his spectacles, and once from loss of sleep and over-eating. There is but one thing more strange than the fact, and that is incredulity as to all such facts. I wish to add that Dr. L. had also 5° of external insufficiency, which left uncorrected has fallen to 2°, where I hope it will remain.

By mental symptoms I mean not the indefinite and vague ones often affecting the disposition or character, as any worry or pain will do, but cases in which after many years or a lifetime of suffering caused by eye-strain, the mental moorings showed positive evidences of giving away, and melancholia, loss of memory, illogical acts, etc., became painfully apparent.

²Keating's Encyclopædia of the Diseases of Children.

I have only lately realized the direct agency of eye-strain in causing night-terrors, insomnia, or non-restful sleep, especially in children forced by ambition, parental pride or an outrageous school system. The profound disturbance of the central nervous system cannot be followed by restful sleep. The injury to its own mechanism must first be healed and equilibrium established there before the normal work, the repair and restoration of the waste and depletion of the peripheral organs can proceed. It is a sad error on the part of those who treat children's diseases to ignore this tremendous factor. The few cases I report are, I am sure, but a fraction of those from whom I failed to elicit the symptom. And how few such little patients reach the oculist in time! Almost without exception parents tell me the nightmare, movements and crying-out in the night soon disappeared after wearing the spectacles. To the same general cause I believe certain rare cases of nocturnal incontinence of urine may be traced. Two cases stopped after the ocular headaches were cured.

As to chorea, I know the smile of incredulity of the neurologists. The smile—not of disbelief—will be in their patients' faces when the prejudice melts away. All that I contend for is that in some cases eye-strain may be a cause, may be the cause. I agree that in the majority of cases it is not the cause. Hardly one of my patients was not better, and several, the worst ones, were cured. When the lenses are broken, the frames bent, or the refraction itself with growth has changed, the choreic movements speedily recommence. Sometimes, when only a coöperating cause, each of the dual or triple causes must be separately dealt with to effect a cure; but the ocular examination under a mydriatic must not be omitted.

I have had several cases of what I have called chorea of the heart, violent palpitation, caused very certainly by eye-strain, and cured by its relief.

I know nothing of epilepsy due to eye strain, except in one instance, that I believe will soon prove itself to be such, sufficient time not yet having elapsed to be dogmatic about it. The case under observation has been growing worse, all treatment utterly ineffective, the etiology wholly mysterious. If the man reads a little while there is violently spasmodic closure of the right eyelids, intense sleepiness, headache, etc. A more fiendish refraction error could hardly be invented :

R.+ sph. 0.62 D. \bigcirc cyl. 2.50 D., ax. 175°.
L.+ sph. 0.25 D. \bigcirc cyl. 1.00 D., ax. 75°.
Extreme hyperæsthesia, exaggerated "nervousness," is a common and clearly-marked symptom of eye-strain. The patient, usually a girl or young woman, is restless, excitable, hysterical, easily frightened, has absurd "crying-

fits," outbursts of violent anger, etc. With spectacles the change from all this is remarkable, and remarked by parents.

I have had a number of patients whose trembling and loss of steady control of the hands or head seemed connected with the nervous storm aroused by ocular work without proper glasses. During the ocular headache the trembling was far worse. "Blind spells" sometimes supervene in the crises, or just preceding them, of ophthalmic migraine and sick headache, and in these crises three patients have complained of great loss of feeling, a benumbing of the hands, arms, lips, etc.

Most of the menstrual abnormalities I have certainly traced to eye-strain are delayed institution of the menses, and amenorrhœa. In two cases the mothers of girls of 16 or 17 years, reported that the long-delayed flow came with a gush within a week or two after relief of eye-strain and its resultant headache.

One young man stuck to it that certain of his teeth always ached whenever he read a long time. I have reported a noteworthy case of stuttering and one of aphonia due to ocular irritation.

Some of the most curious cases I have had were instances of localized and persistent pain,—*e.g.*, a cold tender spot above the right ear, the size of a silver dollar; a swollen patch in front of one ear; a pain continuous for 2½ years in the back of the neck, made worse by reading, and disappearing in 24 hours after getting glasses; a severe pain in the back between the shoulders persisting for many years all the time. It disappeared within a day or two after proper spectacles were worn, was absent for three months, reappeared in 24 hours after glasses were broken, continued for the four days during which the lenses were being reground, and again vanished in a day when the repairing was complete. Has not returned during the past year.

TABLE XII.—DIGESTIVE AND ASSIMILATIVE DISORDERS.

Variety.	Cases.	Per Cent. of all Reflex N.	Per Cent. of Refrac. Cases.
Anorexia and Fickle Appetite . .	134	10.	9.3
Anorexia, alternating With Abnormal Appetite	8	1.	. . . . .
Inordinate Appetite always . . .	1	. . . . .	. . . . .
Constipation	28	2.	2.
Dyspepsia	51	4.	3.5
Nausea and Eructation — not Sick-headache	38	3.	2.6
Car-sickness	17	2.	1.2
	277	22.	19.3

For a long time I have been begging my friends, the general practitioners, to heed the fact that digestion and assimilation may be directly and profoundly disordered by eye-strain. Nothing seems to me more true in medical science than this. I by no means claim that all the cases of my table were the sole result of eye-strain. I have never

had a patient who complained of car-sickness who [if returning to report] was not free from it after wearing glasses. Besides these and sick-headache cases the cases of nausea and vomiting connected with use of the eyes and relieved by "artificial emmetropia" are quite numerous. But by far the most important disorder of the digestive system due to eye-strain, is anorexia—sometimes alternating with excessive appetite. These case of anæmia and malnutrition are almost always young girls or young women, and my records show almost without exception that after relief of eye-strain, the appetite becomes more regular and strong, there is a gain in flesh, health, spirits etc. I am thoroughly convinced that typical cases of anæmia have finally drifted into hysteria and chronic invalidism, when, if taken early, a simple pair of proper spectacles would have brought and preserved health. It is thus, by reducing the general vitality or resisting power of the nervous and assimilative systems that to eye-strain may be indirectly due any type of general organic disease of disastrous consequence or fatal issue. The work of the naturally hyperopic eye, set to unused and impossible tasks by civilization, is directly or indirectly a prolific source of indescribable mischief. If the theory of evolution be true it follows that an organ slowly evolved during millions of years for a special task, distant vision, cannot, in a century or less, be made to different work without disorder and trouble. With one little artificial help, the whole disaster and trouble may be forefended. Just how these strange reflexes are brought about no one would be bumptious enough to pretend to say, since no one can tell why pain follows a pin-prick, or why a nutastatic orchitis may follow parotiditis. These symptoms and results of eye-strain are infinitely diverse, apparently illogical, wonderfully concealed and subtle. Every case is a rule unto itself, so that one can give few general laws to one learning the art. Refraction is a science and an art in intimate union and requires as much patience, delicacy of perception, fineness of judgment and discrimination as any scientific work in the world. In relation to it there are vast fields of inquiry the wisest have hardly begun to explore. The amount of human misery caused by those ocular defects is appalling, and if the prevention and relief of that misery be the motive of scientific medicine, no branch is more important or demands higher powers of mind than that of ophthalmology—and nine-tenths of modern ophthalmic practice consists of refraction!

DISCUSSION OF DR. GOULD'S PAPER.

DR. H. MOULTON asked Dr. Gould if in any of his cases he had seen the axis change after passing from under atropia. Said he had met

such a case, the axis under atropia being 90° and without 110° .

DR. SAVAGE said there could be but two causes for the best meridian under and after atropia. He attributes the difference to deviation of the vertical axes of the eyes caused by the oblique muscles.

DR. G. W. ALDYN said if spasm of accommodation is to be regarded as a fiction, as implied by Dr. Gould, he desired him to explain how a change so great as the following could be accounted for:

O. D. + 2. \bigcirc — 3 cyl. horizontal = $\frac{20}{20}$,
under atropine. O. D. + 5. \bigcirc + 3 cyl. vertical = $\frac{20}{20}$.

PAPILLOMA OF THE CORNEA, WITH REPORT OF A CASE.

Read in the Section of Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY S. C. AYRES, M.D.,
OF CINCINNATI, O.

It sounds somewhat contradictory to say that a papilloma can develop from a surface which is not naturally supplied with papillæ. At first it would seem impossible, but the vagaries of neoplasms are numerous, and this seems to be one of them.

Von Ziemssen, in *Ziemssen's Archives*, Vol. vii, in speaking of papillæ of the larynx, says:

"The development of papillary growths occurs not only off the mucous surface originally provided with papillæ, but, as is especially shown by Virchow (*Krankhafte Geschwulste*, 1, pp. 334 and following), also in regions where papillary structure of the mucous membrane is entirely lacking. The first step is the proliferation of the superficial connective tissue, the development of a little amorphous granular or homogeneous nodule, in which cells are not to be recognized until later. As the cells multiply, they gradually grow and put forth buds, just as is done by the preëxisting papillæ. The capillary loops of the papillæ are large; the surface of the neoplasm is covered with a thick layer of epithelial cells.

"The size and form of papillary tumors are very various. At first they represent little buttons or pegs; afterwards warty formations, as those representing a cock's comb; in case of luxuriant development, high growth similar to a berry, grape or cauliflower in form, which may partly or entirely fill the upper and middle, more rarely the laryngeal cavity."

Cornil and Ranvier say in relation to the development of papillomata, "that mucous papillomata generally spring from the villi or papillæ of the mucous membrane, but they form [where there are no papillæ, for example, in the ventricles of the larynx." The minute phenomena of these hypertrophies and new formations have not

yet been followed very closely, but the analogy of their structure with that of inflammatory granulations, supports the supposition that their mode of formation is similar. They say further as to location, that we find papillomata seated upon nearly all parts of the cutaneous and mucous surface.

Dr. Sajou, in his work on Diseases of the Nose and Throat, says that "papillomata are wart-like growths occasionally found in the nasal cavities of young subjects. They are most frequently attached to the septum and to the inferior turbinated body. They vary in size from that of a lentil to that of a small chestnut, and present a very light brownish color, with an irregular corrugated surface."

In relation to papillomata of the larynx he says: "This class of growth does not present a characteristic appearance which enables a positive diagnosis to be made; they, however, possess certain properties in common which render an approximate recognition of the nature possible."

They often present small round projections which cause them to be termed raspberry, mulberry, cauliflower, etc., because of their resemblance to them; they are usually located at the anterior portion of the larynx, and on the vocal bands near the anterior insertion.

Mackenzie, in his work on the Diseases of the Nose and Throat, says that papillomata are by far the most frequent of all benign growths of the larynx. He says also that papillomata are found in the nose, and are more common than is generally supposed.

Throughout the ophthalmic literature I see numerous reports of cancrioid of the cornea. In the seventh volume of Graefe's Archives is a report by von Graefe of two cases of cancrioid of the cornea which he scraped off, and which, from the description, resembled my case in its early stages, but it was composed of epithelial cells with a very little connective tissue. In the fourteenth volume of the same, Dr. Knapp reported two cases of cancrioid of the cornea and limbus conjunctiva, but nothing is said of the microscopic appearance of the growths. Cases defined positively as papilloma are not very numerous in the literature at my command.

In the *Lyon Medical* for 1879, M. Gayet reports a case of papilloma of the cornea. It was seated on the left cornea of a man 67 years of age. The disease was two years in reaching its present size and had never caused much pain. It occupied four-fifths of the cornea and left only a small portion of the periphery free, vision being only lateral and reduced to $\frac{1}{8}$. The tumor, flat, and compressed by the action of the lids, was of a rose gray tint, and presented a characteristic appearance. Examined histologically it was demonstrated to be a papilloma to the exclusion of sarcoma and epithelioma. It was treated by a

powder of alum dusted on its surface with a hair pencil and the result was surprising. It disappeared in the course of two months and there was a *restitutio ad integrum* of the cornea, and vision was increased to one-fourth. Berry, in his excellent work on the eye, in speaking of tumors of the conjunctiva, says, that of the non-malignant forms, perhaps the most common are papillomata. They usually occur as multiple excrescences from the conjunctiva at the inner angle of the eye in the region of the caruncle, but are found at the same time springing from the palpebral conjunctiva. These surfaces are often uneven and crenated, but may also be smooth.

Pollock in his work on Histology of the Eye, says that Sczokalsky has described a tumor arising from the limbus conjunctiva, in which the papillary processes composed of spindle shaped cells containing blood vessels, were covered with a stratified epithelial layer.

Alt examined a growth of the conjunctiva in which there were epithelial papillæ, amongst, and in the cells of which lay granules of pigment.

In the Transactions of the American Ophthalmological Society for 1879, Dr. Wm. F. Morris of Philadelphia reports a case of recurrent papilloma of the corneo-scleral junction. It was in the person of a man 56 years of age. It was about half in the sclera and half on the cornea, and the tip of the growth extended about to the center of the cornea. It was first dissected off and then cauterized. It returned and in five months the operation was repeated. It was then cauterized with nitric acid, and this time it was successful, there having been no return of it since.

At the meeting of the Ophthalmological Society of the United Kingdom, December 13, 1883, Mr. Anderson Critchett and Mr. Juler exhibited a case of papilloma of the conjunctiva. It had been first noticed when the patient was nine years old and she was now fourteen.

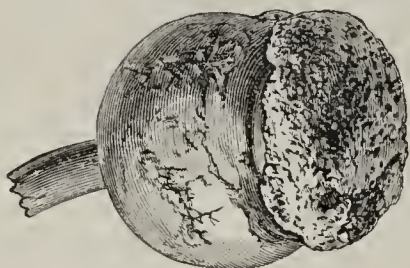
Schiess Gemeuseus observed a case of papillary excrescence on the conjunctiva of both lids in a young man 17 years old. It had a whitish rough surface. It had existed for about six months. In the cheek of the same side there was a lupus. The papilloma was treated by scrification and the use of silver nitrate in solution and astringent applications.

In the *Recueil d'Ophth.* Jules Fontan reports a case of adeno-papilloma of the conjunctiva.

H. C. Boenning, in the *Philadelphia Medical Times*, reports a case of hairy papilloma of the conjunctiva.

Ewetzky describes a case of papilloma of the cornea and conjunctiva in the person of a woman 50 years of age. It covered the entire cornea except a part of the outer and lower quadrant. Upwards and inwards from this tumor and about 2-3 mm. distant on the conjunctiva was another similar growth.

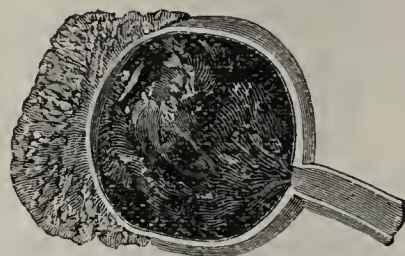
The case which I here present was in the person of Mrs. K. G., æt. 50, a healthy, well-nourished woman, who was seen first on the 7th of May, 1889. There was a large growth on the anterior portion of the left eye, involving the entire front of the ball. It had the appearance of a cauliflower, and its edges spread out beyond its attachment to the globe. It projected 1 cm. from the sclera, and its horizontal diameter is



3½ cm., and its vertical diameter 2 cm. Her history is as follows: She says that six years ago she noticed some veins extending from the outer portion of the ball inwards towards the cornea, where there was a slight elevation on the sclera. This continued to grow and enlarge until about two years ago, at which time it was about as large as a small hazel nut. It was then removed by her physician, but it grew very rapidly, and he removed a portion of it every week or two. He kept up this method of treatment for about six months, when he discontinued it. The tumor was allowed to grow unchecked until August, 1887. At that time it had grown to the size of a large hazel nut, and protruded between the lids. It seems, however, that up to this time it had not encroached very far on the cornea, as she says she could still see very well. In August and September, 1887, it was operated on several times, a small portion being cut away each time. Since then it has been allowed to grow unchecked by any surgical interference (a period of twenty months), until it has assumed the proportions I have given above. There is no history of cancer in the family, and it has not been accompanied by any pains which might be indicative of a malignant growth. It annoys her by its immense size, and the consequent exposure of its surface to the air, as the lids do not completely cover it. I advised enucleation, as the eye was very unsightly, and there was no possibility of restoring any vision. To this she readily consented, and the globe was enucleated without much difficulty in the ordinary way. She made a rapid recovery, and since then, now two years, there has been no return of the growth. The specimen was examined for me by Dr. James M. French, who gave the following report:

The specimen from the eye of Mrs. G., which you recently gave me for examination, proves to be a papilloma. Its structure consists of exceedingly delicate papillæ, which appear to spring

from almost the entire anterior surface of the cornea. I have not yet been able to make an altogether satisfactory section of it, but I think that the growth must have originated from the conjunctiva, and that its presence upon the cornea is only an extension of the tumor upon its surface; for I cannot conceive of the possibility of a papillary growth originating from a tissue like the cornea. I cannot state positively that



the connective tissue of the central portion of the papillæ is, or is not, directly continuous with the corneal tissues, but such appears to be the case, the cornea having become vascular.

The only interesting feature, microscopically, of the tumor, aside from that to which I have just referred, is the very long, slender and delicate character of the papillæ, which appear to be primary.

I have not yet been able to find any secondary off shoots, and if any are present, they originated at, or very near to, the apices of the primary papillæ. The central fibrous framework of the papillæ is very delicate, and supports little more than a single layer of columnar epithelial cells, without a well-marked corneous layer. The tumor was, of course, benign in character.

In this case there seems to have been no doubt as to the microscopic structure of the growth, its distinctive histological characteristics being beyond doubt. I regret I am not able to present to you more confirmatory reports of parallel cases.

EXCISION OF DISEASED EYEBALL, FOLLOWED BY RELIEF OF REFLEX CEREBRAL SYMPTOMS.

Read in the Section on Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY H. MOULTON, M.D.,

OF FORT SMITH, ARK.

CONSULTING SURGEON TO THE EYE AND EAR DEPARTMENT, ST. JOHN'S HOSPITAL.

The following case seems rather unique, hence is reported:

Mr. R., æt. 40, single, and a farmer, was sent to me May 19, 1890, by Dr. Thomas, of Booneville, Ark. When 6 years old, some lye thrown into his right eye had destroyed its sight. The eye then gave no special trouble until twenty years afterwards, when it became inflamed and ruptured, discharging the lens and part of the vitreous. During the past twelve years it has

been subject to occasional attacks of pain, mild at first, but becoming more severe and of greater frequency. For a year or more the patient has suffered from almost constant frontal headache. During the past eight months, insomnia and symptoms of mental aberration were added. The mental trouble assumed the form of melancholy. The patient became suspicious of his friends, fearing bodily and other injury at their hands, and attempted on several occasions to leave his home. At the date of his appearance in my office, the right eyeball was merely a small, hard, drunken cicatricial button, tender to the touch. V. L. E., $\frac{2.0}{4.0} + 1.20 = \frac{2.0}{2.0}$. Under cocaine, the right eye was enucleated May 20. The patient reported the first sound night's sleep for many months. He was free from headache, and felt more cheerful and better in every way. This improvement was lasting, and he became himself again, following, during the next summer and winter, his usual avocation. It seems his headache, insomnia and melancholia must have been aggravated, if not caused in a reflex way, by cicatricial compression of the terminals of the nerves supplying the eyeball, producing cerebral vascular disturbances. Reflexes arising in a similar way are mentioned¹ but rarely.

I have just learned that the patient's friends have some fear of a return of his melancholy. Should this eventually prove true, it yet seems, from the great improvement following the operation, that the relation of cause and effect, as above premised, must have existed.

DISCUSSION.

DR. EDWARD JACKSON said he once enucleated an eye in a patient in whom there was mental aberration, which he attributed to fear.

DR. C. A. WOOD called attention to the fact that many cases of temporary insanity are relieved by the operation, but recurrences are liable to occur. He thinks insanity may be anticipated in such cases.

DR. FROTHINGHAM said that in connection with this case reported by Dr. Moulton, he wished to mention a case in which he had removed two painful stumps of eyes from a young lady for the relief of intense headaches that seemed due to the irritation which they caused. The headache was the trouble from which the young lady sought relief, and it was permanently cured by the operation.

THE sum of \$30,000 has been collected for the establishment of a children's hospital in Louisville, Ky., in commemoration of the destructive tornado which some time ago passed over that city. This is a very literal translation of the old proverb, "It is an ill wind that blows nobody good."

TREATMENT OF IRIDO-DIALYSIS FROM CONTUSION. PARTIAL IRIDENKESIS, WITH OR WITHOUT SUTURE.

Read in the Section on Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY EUGENE SMITH, M.D.,

PROF. OF OPHTHALMOLOGY AND OTOTOLOGY DETROIT COLLEGE OF MEDICINE.

Among the anomalies of ophthalmology is the condition known as irido-dialysis from contusion. Anomalous, because, while well known to all ophthalmologists, described in all ophthalmic works of importance, and its discomforts fully recognized, no treatment is advised or even suggested.

That treatment is unimportant in the lesser degrees of the trouble, "goes without saying;" but in cases where the separation of the periphery of the iris is one-fourth of its circumference, and the accommodation normal, as occasionally happens, the dazzling and monocular diplopia is extremely annoying. This is particularly the case when the detachment is situated at the inner, the outer, or the lower periphery.

The segment of iris torn from its peripheral attachment becomes paralyzed, and later on, atrophied.

Many years ago Critchett gave us the operation of iridodesis, which Stellwag, Wecker and others have modified, and the operation which I have found so successful is a yet further modification of Critchett's, or rather, of the iridenkleisis of Stellwag, with this difference, the whole width of the iris from the pupillary border to the detached periphery is not dragged into the wound at the sclero-corneal junction.

With these few remarks I will ask your consideration of a method of treating these cases which I have employed four times in the past five years, which in each case has been successful, and which, as yet, has been followed with no untoward results.

My operation is as follows: A narrow, somewhat slanting incision is made in the cornea near the sclero-corneal junction with a broad needle or a very small keratome. Fine forceps are introduced and the iris near its detached periphery is seized and drawn into the wound. A small portion only is drawn through the wound, enough only to insure being held in position by a compress bandage till healing has taken place. In order to more thoroughly secure its maintenance in the wound a fine suture may be passed through the conjunctiva at the border of the wound and the iris stitched thereto. The suture may be removed in 48 hours. In three of my cases the operation was made as described without suture.

The fourth case was quite extensive, the rupture measuring 10 mm. long and 4 mm. wide.

¹ Internat. Encyc. Surg., Vol. v, p. 210.

In this case I made a double incision, the two incisions being about 4 mm. apart, and I drew a bit of iris into each wound. I did this because a single antero peripheral adhesion of the iris would be insufficient to cover the peripheral rupture.

The case recovered without untoward symptoms and was perfectly well 7 months later, at which time I last saw him.

Objection to the operation may be offered on the plea of possible sympathetic mischief from dragging, but as the operative procedure does not restore the ruptured nervous connection this danger is problematical, if not chimerical.

DISCUSSION.

DR. G. W. ALLYN, Pittsburgh: A man 47 years of age who had lost his right eye by a former accident came for treatment of his left and only useful eye.

A fragment of steel had struck the center of the cornea a glancing blow, cutting outward and well into sclera. Through this wound a ribbon of the iris detached from the outer third of its attachment protruded as a loop. Hoping to preserve a central pupil I carefully cut the protruding iris, leaving the ends in the wound. The eye healed in time. When ready to resume his work a glass correcting the astigmatism gave a vision of $\frac{20}{20}$.

At the end of one year I find the astigmatism less and the vision unimpaired for all of his work, parts of which are very exacting.

SECTION OF STATE MEDICINE, 1891.

Chairman, J. D. Plunkett, Nashville, Tenn.
Secretary, Benj. Lee, Philadelphia, Pa.

FIRST DAY.

The Section met at the Columbian University, Washington, D. C., at 3 P.M. There were present and registered during the session

John H. Rauch, Springfield, Ill.
N. S. Davis, Chicago, Ill.
A. N. Bell, Brooklyn, New York.
J. B. Lindsley, Tennessee.
C. G. Comegys, Cincinnati, O.
Charles McIntyre, Pennsylvania.
M. G. Motter, Lancaster, O.
G. H. Rohé, Baltimore, Md.
J. Harvey Reed, Mansfield, O.
Gustavus F. Franklin, Chillicothe, O.
D. F. Lincoln, Geneva, New York.
W. Wyman, U. S. M.-H. S.
T. A. Foster, Portland, Me.
C. W. Chancellor, Baltimore, Md.
C. A. Lindsley, New Haven, Conn.
Benj. Lee, Philadelphia, Pa.
A. L. Gihon, U. S. Navy, Brooklyn, New York.
J. T. Reeve, Appleton, Wis.
J. Bochrán, Montgomery, Ala.
C. O. Probst, Columbus, O.
J. N. McCormack, Bowling Green, Ky.
G. S. Franklin, Ohio.

J. F. Hibberd, Richmond, Ind.
J. T. Motter, Georgetown, D. C.
Charles H. Shepard, Brooklyn, New York.
B. O. Reynolds, Lake Geneva, Wis.
W. C. Briscoe, Washington, D. C.
H. F. Lyster, Detroit, Mich.
J. H. Hamilton, Richford, Vt.
D. J. Jennings, Cleveland, O.
E. A. Gibbs, Washington, D. C.
Geo. Purviance, U. S. M.-H. S.
D. Sinsté.
Geo. Homan, St. Louis, Mo.
John H. Fulmer, Quakertown, Penn.
Frank Ball, Lock Haven, Penn.
A. P. Hull, Montgomery, Penn.
Geo. W. Jenkins, Kilbourne City, Wis.
Lawrence F. Flick, Philadelphia, Penn.
Robert Selden, Catskill, New York.
H. W. Thayer, Corry, Penn.
O. F. Sheldon, Lyons, New York.

In the absence of the chairman, Dr. J. I. Plunkett, Dr. John H. Rauch, was, on motion, Dr. J. Berrien Lindsley, called to the chair.

The address of the chairman being necessarily passed over the report of the Committee on School Hygiene was read by Dr. D. F. Lincoln, Chairman of the Committee. Dr. Lincoln presented his report by the statement that it was mainly synoptical and presented only such results as all the members had been able to agree upon. Several of the members of the committee had prepared papers on the special subdivisions of the general subject which had been assigned them respectively, and were present to read the same as supplementary to the report.

At the conclusion of the reading of the report Dr. Lincoln presented a paper entitled "Remarks on the Construction of School Houses."

The report and paper were declared open for discussion.

Dr. Gihon assented to the propositions laid down by Dr. Lincoln in the main. He considered the reference of the speaker to the hygienic defects of the hall in which the meeting was in session, especially well timed. This was a building of modern construction, erected at a lavish expense for the express purpose of a class or school room, and yet as had been pointed out, its lighting was execrable, and as he had discovered during the reading of the paper its acoustic properties were still worse. With reference to the strictures passed upon natural ventilation, *i.e.*, by means of windows, he was not so thoroughly convinced. He had when in charge of a Navy School adopted the expedient of placing a four inch board under the edge of the lower sash, thus allowing an upward current of air to enter at the junction of the upper and lower sashes, and he had found that ventilation could be quite satisfactorily secured in this way without creating dangerous drafts. It was objected to this that it only furnished a means for introducing fresh air and did not provide for the escape of the foul air.

Dr. R. Harvey Reed replied that actual obser-

ation of an opening created in this way, showed that there was an alternation of inward and outward currents. The air would enter for a few moments and then pass out for a similar length of time.

He considered that the foul odor noticed on entering an ill-ventilated school room was not in any sense dependent upon or to be taken as a measure of the amount of carbon dioxide in the air of the room. It depended on sulphuretted hydrogen, carburetted hydrogen and organic filth resulting from perspiration and respiration.

Dr. M. G. Motter, of Lancaster, Pa., suggested that, in the same way that ventilation could be obtained by the four inch board under the sash, it could also be obtained by having two panes of glass so adjusted on an ordinary sash that the air could pass freely in and out between them. He inquired whether inspection of schools was not a proper function of the Health Commissioner of a city.

Dr. C. A. Lindsley held that even though the air from a window raised with the four inch board entered with an upward direction, its density compelled it to fall upon the heads of those near the window before admixture with the general air of the room.

Dr. McIntire agreed with Dr. Reed that the odor of the room in no way depended upon the presence of carbon dioxide, but upon the organic impurities, and that on the other hand the amount of carbon dioxide present, could not be accepted as a test of the impurity of the air.

Dr. Lincoln remarked, in reply, that undoubtedly emanations of various kinds and of all kinds from the human body contributed to the foulness of the atmosphere of a school room, but that where carbon dioxide was found in excess, as a product of respiration, it indicated necessarily the presence of other impurities, also products of respiration and other excretory processes which are extremely difficult to detect and to determine. The value of the determination of the percentage of carbon dioxide, therefore, was that of a general indicator of impurity.

Dr. Chancellor considered it of quite as much importance to provide special means for the exclusion or exhaustion of the foul air, as for the introduction of the fresh. Two bodies cannot occupy the same space at the same time. Unless the foul air is first removed, the fresh air cannot enter. In cold weather the pure air should be introduced warm; the outer air at a freezing temperature should not be brought in.

The difficulty of obtaining a pure outer air in crowded centres of population is not sufficiently appreciated. In these days of rapid transit why should we not establish our public schools in suburban districts, where there is an abundance of pure air, and furnish proper facilities for the pupils to reach them.

Dr. Lincoln pointed out the extensive character of the work assigned the committee, stated that it did not by any means consider that it had yet accomplished this work, and in the name of the committee requested its continuance.

On motion, this request was unanimously acceded to.

The committee thereupon continues as follows, to report next year :

Committee on School Hygiene.—D. F. Lincoln, Geneva, N. Y., Chairman; Geo. H. Rohé, Baltimore, Md.; J. G. Pinkham, Lynn, Mass.; W. L. Schenck, Osage City, Kansas; R. Harvey Reed, Mansfield, Ohio.

Dr. Rauch requesting to be excused from the duties of the chair, Dr. A. H. Gihon was, on motion, called to its occupancy.

Dr. Gihon inquired whether the roll of the Committee on State Medicine had been called, and stated that it had been customary to do so. The roll was therefore called, and it was found that but five members out of forty-two (two of the committee being deceased) had registered in this Section. Further discussion of the subject was deferred until after the reading of the papers.

Dr. R. Harvey Reed of Ohio then read his paper entitled "Original Investigations on the Heating and Ventilation of School Buildings." This paper was accompanied by the exhibition of a large number of charts illustrating the following points from actual and accurate observation :

1. Date and time of day inspection.
2. Name of building and room.
3. Number of cubic feet of air in room.
4. Number of pupils present.
5. Outside temperature.
6. Temperature of room at levels of head, feet and ceiling.
7. Humidity outside.
8. Humidity in room at levels of head, feet and ceiling.
9. Kind of heating apparatus in use.
10. System of ventilation employed.
11. Number of cubic feet of fresh air supplied and of foul air discharged per hour.
12. Estimation of amount of carbon monoxide present in the air of the room.
13. Estimation of the amount of carbon dioxide present in the air of the room.
14. Consideration of the amount of organic matter present in the air of the room.
15. Bacteriological examination of the air of the room.
16. Miscellaneous remarks and suggestions.
17. Conclusions.

The paper of Dr. Geo. H. Rohé, member of the Committee on School Hygiene, was then read by the author, the title being "The School Sanitary Inspector; His Qualifications, His Duties, and His Powers."

The paper of Dr. W. L. Schenck, a member of

the same committee, on "The Personal Hygiene of School Children," was next in order. In the absence of the author, the secretary read an abstract of the paper which had been prepared by the Chairman of the Committee, Dr. D. F. Lincoln. The subjects embraced were Physical Training, Study, Time and Amount; Recess and Location, Instruction in Hygiene, by Whom and How to be Taught, and the Prevention of Contagious Diseases.

The Secretary read a telegram from Dr. Octavius A. White, who had been announced to open the discussion on this subject, stating that illness prevented his presence. Dr. Gihon therefore called upon Dr. N. S. Davis, as the oldest member of the Section, to take his place.

Dr. Davis spoke in terms of high commendation of the industry displayed in the preparation of the report and the various supplementary papers, especially the tabular work of Dr. Reed's paper.

The period of childhood was certainly that in which the greatest results could be accomplished by proper hygienic influences. Could we have such influences in active operation in school as well as at home, it is not too much to hope that nearly all of the defects which we call hereditary could be eliminated from our people in the course of a few generations. It should be the especial duty of the physicians to instruct the heads of families in which he is the medical adviser in the laws of health, especially as regards growing children.

Dr. Cochran being called upon, said that he had listened with amazement to the proposed qualifications for school inspectors. Certainly it would be a long time before it would be possible to inaugurate such a system in his part of the country. He could only express his gratification at what had already been accomplished by the gentlemen who had read the papers.

Dr. Hibberd described the condition of the country school house of his early days, in which lack of sufficient introduction of fresh air was not a noticeable feature.

Dr. Lyster, of the Michigan State Board of Health, spoke with regard to that portion of Dr. Reed's paper which referred to the Smead system approvingly. His board had been deeply interested in the study of that system in numerous educational buildings in their State. So far as it was associated with a process for dessicating fæces, they had been compelled to report adversely upon it. When disconnected with any such process, and used simply for the introduction of pure warm air and the exhaustion of impure air it certainly worked admirably.

Dr. McCormack, Secretary of the State Board of Health of Kentucky, while deeply interested in so much of the papers as he had been fortunate enough to hear, and commending their purpose, coming as he did from a Western State,

felt that the suggestions were many of them such as could only be successfully carried out in the land which we name Utopia.

He moved that the reports and papers be referred to the Association and the committee continued. It was carried.

Dr. McCormack stated that a resolution was passed in the Association at the morning's session calling upon each Section to appoint a committee to confer with similar committees from the other Sections to consider the subject of perfecting the organization and improving the work of the Sections.

He therefore moved that the chair appoint a committee of three for this purpose.

The motion was carried and the chair appointed Drs. R. Harvey Reed, A. N. Bell and J. T. Reeve as such committee.

The Section then, on motion, adjourned to meet at the same place on Wednesday, May 6th, at 3 P. M.

SECOND DAY.

The Section convened at 3 P. M., May 6, 1891, pursuant to adjournment.

Dr. J. Berrien Lindsley of Nashville, Tenn., the oldest ex-chairman present, was, on motion, called to the chair.

Dr. N. S. Davis of Chicago, Ill., then presented his report as chairman of the Committee on "Meteorological Conditions of the Atmosphere and Their Relations to Coincident Prevalence of Disease." The report was founded on an immense number of careful meteorological observations, and sanitary and mortuary returns, showing much faithful and persevering labor. It drew attention to the apparent influence of the presence of ozone and peroxide of hydrogen in the atmosphere in diminishing the amount of albumenoid impurities. The alternate prevalence of typhoid fever and pneumonia was adduced in favor of this theory. A considerable portion of the report was devoted to the consideration of the influence of the presence of epidemic influenza, in increasing the frequency of many other diseases, such especially as pneumonia, acute bronchitis, typhoid fever and diarrhoeal affections.

The report was listened to with deep interest. Discussion being called for, Dr. Flick, of Pennsylvania, considered that a serious source of error existed in all our statistics of influenza, from the fact that many cases of pneumonic complications were reported as pneumonia, which, when the symptoms were carefully sifted, could not be maintained to be so. It was a special condition peculiar to influenza, in which localized foci of inflammation were found distributed throughout the lung tissue. The same might be said of the diarrhoeal complications. Strictly, all of these cases should have been returned as influenza.

Dr. Farrington, of Ireland, who was present

by invitation, drew attention to the somewhat remarkable fact, that the statistics of influenza in his country showed that this disease made its appearance with them at about the same time that the earlier cases were reported in America.

Dr. Davis was fully aware of the errors liable to creep in from false diagnosis, as referred to by Dr. Flick. These liabilities, however, existed at all times and in all places. They were not confined to times of epidemic or to certain cities. His own impression was very strong that, during the prevalence of an epidemic, and especially one of such an affection as influenza, which manifested itself in so many different ways, the danger was rather that other affections should be falsely designated as cases of the prevailing disease which was uppermost in every mind, than the reverse. The same remarkable simultaneousness of appearance observed by the gentleman from Ireland, on the two sides of the Atlantic, was observable in different sections of our own country.

In conclusion, Dr. Davis requested to be excused from a further continuance of the self-imposed labor which he undertook at the meeting at Newport, in the preparation each year of this report, feeling that his declining years and strength would not permit him to devote the necessary time and energy to it. The Secretary remarked that whatever of physical abatement of force and diminished elasticity the reader of the report might be personally conscious of, these conditions had certainly not in the slightest degree reached his mental vigor. He had been in doubt whether most to admire the great value of the report or the amount of labor which had been expended in its preparation. It was, however, due to Dr. Davis that his request should be granted, and in seconding it, he also wished to move a special vote of thanks to that gentleman for his services in connection with the Section. The motion was carried. Dr. Davis feelingly acknowledged the compliment, and proceeded to sketch briefly, for the benefit of those who should take up the work of the committee, the lines on which it had been prepared to carry on these observations. The different agencies on which he had relied for information were:

First. The United States Signal Service Observers, at such points as it had been deemed advisable to obtain data, for the meteorological observations which they are by law required to make.

Second. Other scientific observers, official or voluntary, for determinations of ozone and peroxide of hydrogen at or near the same points.

Third. Chemists, who could be relied upon for examinations of the atmosphere for organic impurities, at the same stations and

Fourth. Physicians, who were called upon to make returns of all cases of acute disease occur-

ring in their own practice, in the neighborhood of these stations.

He regretted to be compelled to say that, while the Signal Service officers were perfectly ready to give all the assistance in their power, and scientific voluntary observers were also to be depended on, and a chemist could occasionally be found who was willing to devote attention to the subject, the physicians could not be aroused to a sense of the importance of the subject, or to give the slightest assistance.

Dr. Hibberd suggested that it would facilitate the work of the Section in this respect if Dr. Davis would kindly name his own successor in the work, and a motion was passed requesting him to do so, at his convenience.

In the absence of the author, Dr. C. A. Lindsley read the paper of Dr. Joseph R. Smith, Colonel and Surgeon U. S. Army, Medical Director Department of Arizona, entitled "Sickness and Mortality in the Army of the United States."

Dr. A. N. Bell, of Brooklyn, then read his paper on "The Beneficence of Disease."

A paper on "The Sanitary and Unsanitary Relations of Underground Waters" was next read by Dr. Peter H. Bryce, of Toronto.

Dr. Lawrence F. Flick, of Philadelphia, followed with a paper on "The Duty of the Government in the Prevention of Tuberculosis."

Opportunity for the discussion of these valuable papers, which were listened to with great interest, was prevented by the fact that it was necessary to vacate the room by a certain hour.

Election of officers for the ensuing year being now in order:

Dr. Bell nominated Dr. Benjamin Lee, of Philadelphia, as Chairman.

There being no other nomination, a *viva voce* vote was taken, and Dr. Lee was announced as elected.

Dr. Hibberd nominated Dr. Lawrence Flick, of Philadelphia, as Secretary.

There being no other nomination, a *viva voce* vote was taken, and Dr. Flick was announced as elected.

On motion of Dr. Bell, it was resolved, that the Chairman and Secretary elect be a committee to nominate the members of the Committee on State Medicine, and be instructed to send the list of the names to the Secretary of the Association.

The Section then, on motion, adjourned to meet at the same place at 3 P.M., May 7, 1891.

BENJ. LEE, SEC'Y.

THIRD DAY.

The Section met, pursuant to adjournment, at 3 P.M., May 7, 1891.

Dr. J. Berrien Lindsley was called to the chair. The Secretary announced that he had received a telegram from Dr. J. D. Plunkett, the Chairman

of the Section, stating that he had been detained by the sudden illness of his wife, and regretted that he would be unable to be present.

Dr. A. N. Bell moved that the Secretary be instructed to express to Dr. Plunkett the regrets of the Section at his absence, and to request him to forward at once a copy of his address for publication. It was carried.

Dr. H. O. Marcy being compelled to read a paper in another Section, his paper was substituted for the first paper on the programme, the author of which was absent. Dr. Marcy read his paper on "The Coroner System in the United States."

The paper of Dr. George M. Sternberg, Lieut.-Col. and Surgeon U. S. Army, on the "Disinfection of Excreta," was read, in the absence of the author, by Dr. Peter H. Bryce, of Ontario.

Dr. C. W. Chancellor, Secretary of the State Board of Health of Maryland, then read a paper on "Simple Methods of Sewage Disposal," accompanied by the presentation of a model apparatus for the purpose of use in suburban residences.

The Secretary read a letter from Dr. Robert C. Davis, member of the Board of Health of the City of New York, stating that owing to illness, he regretted to be unable to be present to open the discussion on these papers, as announced.

Discussion being invited, Dr. Lyster, of the Michigan State Board of Health, remarked on the fact of the necessity of some definite action on the part of the Section for the protection of water supplies, both in wells and rivers, from the sources of pollution referred to in Dr. Chancellor's paper. He thought we should put ourselves on record as utterly condemning the use of the ordinary unprotected privy vault.

Dr. Bryce, while greatly interested in the manner in which Dr. Chancellor has sketched the different methods of sewage disposal, and in the method proposed for dealing with it in small quantities, which he could see might work very fully for separate houses, confessed that he had been disappointed in the want of success attributed by the reader of the paper to systems of sewage irrigation. Water carriage has such a vast advantage over all other systems in convenience, and in cleanliness, and in inoffensiveness about the residence or building, and with good modern plumbing may be made so perfectly safe to the occupants of the house, that we are practically compelled to accept it for all towns of any size.

It had been demonstrated that the separate system could be introduced for a town of 5,000 inhabitants, at a cost of from \$7,000 to \$9,000 per mile, with all necessary appliances for flushing automatically. The question of expense, therefore, is met. The only question is, in cases where there is not a large river with a strong current, what to do with the effluent. It did seem

to him that Dr. Chancellor had overstated the difficulties attendant upon treating this by irrigation. As an instance of how readily this might be done, he referred to the system in use by the London Hospital in Ontario. The entire plant, from beginning to end, cost only \$25,000, and it sufficed for the necessities of a population of 1,200 people. The separate system was adopted. The irrigation farm was only four acres in extent. One-third of this surface was used every day, so that each portion had two days of rest. The effluent flowed on to it, so thoroughly mixed by its rapid passage through the pipes, that it was absolutely fluid and left only a thin film on the surface, which when dry was raked in by a laborer. There had never been the slightest offensive odor from it, and chemical tests indicated complete nitrification of all the organic filth.

Dr. Chancellor, in closing the discussion, said that Dr. Bryce had evidently misunderstood him, as regarded the intent of his paper, which was not intended to take up the discussion of large systems of sewerage, but only of devices, where large systems are not available. His figures on the expensiveness of irrigation were with references to places in which it was absolutely necessary to prepare the ground by an elaborate system of double under drains. Very few places were so fortunately situated as London with its natural filter bed of sand close at hand. And even then he feared that in a few years it would be necessary for them to take in new ground for the purpose. This had been the experience in Berlin and other Continental cities. In regard to the purification of infected wells, he had often been able to accomplish it by having a quantity of chloride of lime placed in the well, allowed to remain a few hours, and the well then pumped out completely. By repeating this process two or three times, the water could often be completely purified. Of course, when it was practicable, he preferred to have such a well abandoned.

The next and last paper of the programme was read by Dr. G. W. Jenkins, of Kilbourne City, Wisconsin, under the title "Hygiene in the Rural Districts."

The suggestion contained in the paper that physicians could do much to improve the hygienic conditions in rural districts, by forming social clubs, which should meet from house to house, and before which demonstrations of truths familiar to hygienists, which would interest and impress the minds of the people, was considered a practical and valuable one by Drs. Lee, Lyster and other members.

The section was then declared adjourned, to meet at the time and place determined upon by the Association, in the year 1892.

BENJ. LEE, *Secretary*.

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SATURDAY, SEPTEMBER 19, 1891.

HOW SHALL MEDICINE BE TAUGHT?

As the time for the opening of the colleges approaches, the methods of teaching again present themselves for discussion. Shall the teaching be by lectures, or recitations, or some other method?

By the recitation method the contents of a text-book can be very thoroughly learned by the student; the exact meaning of the language employed can be made clear. A text-book, to be of special advantage, must be accepted in its entirety, or practically so. All successful teaching is dogmatic. If the teacher lectures he may be dogmatic, but if he uses a text-book, he must surrender his dogmatism, his position as master, to the text-book, for there cannot be two masters in the same house. To use a text-book, and then make frequent additions to the text, or differ from it frequently, can only introduce confusion. The recitation method of teaching then necessitates the use of a text-book which can be accepted by the teacher as complete, explicit, and reliable. In what branches of medicine is it possible to find such text-books? In anatomy suitable works are available. Let us take GRAY. Now, where shall we find the genius who can teach a class of 40 men through GRAY in 40 or even 60 hours? Assuredly the work would be much more superficially done than if even a mediocre lecturer had spent the time with the class.

In a recitation much time is necessarily lost in asking questions, explaining questions, and receiving slow responses, and much more is often aggravatingly lost in idle discussions of unimportant points, which cannot be altogether avoided. The recitation method is slow. On the other hand, the properly-trained lecturer studies for his class, and by doing the work for a hundred men becomes a time-saver and labor-saver of the greatest importance. A text-book in physiology might be found in LANDOIS, FOSTER, or even YEO's manual. The science of chemistry is so far advanced, is so accurate, and free from theories, that it might be taught from a text-book, instead of by lectures. But there is not a book on medical chemistry which will answer the purpose.

If the practical branches are considered, just two will be found so far developed and reduced to such definite conditions as to admit of instruction by text-books, and these two are obstetrics and ophthalmology. The principles of surgery and general pathology might with advantage be taught from a book, but not so the practice of surgery, the practice of medicine, or gynecology. For the practice of medicine not a single text-book can be found to which a conscientious teacher would be willing to limit his class. Short, bare statement of great facts may be sufficient for one who has read widely, but they are barren to the student.

In the important matter of etiology, all our text-books are strangely deficient, and in that special branch of etiology, bacteriology, no text-book can keep up with the times.

The text-book is a voice from the dead. It is lifeless and can never be made to take the place of those great teachers, who through their individuality, have impressed, not themselves, but the great truths of medicine on the minds of their hearers, and imparted new life to them. Imagine MEIGS, FLINT, DALTON or GROSS with text-books in hand! The practical branches of medicine contain too much of the art to be successfully relegated to books for elucidation.

Medical education should aim to do more than merely implant facts. Medical culture is needed. A culture which shall enable the student and practitioner to take comprehensive views, to think broadly, to give to opinions and statements a proper weight, to realize the inherent deficien-

cies of his own information, to possess a frame of mind which is capable of receiving new discoveries. In such a scheme of education, the text-book plays a most pernicious part. It is essentially narrowing, and conducive to a condition of shallow bigotry. Much more culture can be imparted by a lecturer who is himself the possessor of broad views. The great field of medical literature should be thrown open to the student and he should be taught how to cultivate it. The many views of many minds is the great corrective of narrowness.

Aside from the question of text-books or lectures, there is another great branch of medical teaching which bids fair to come so far to the front as to throw completely in the background this other question.

The objective method of teaching medicine has made great strides lately, and is bound to become more and more prominent. To learn anatomy without dissecting is impossible. Physiology should never be taught without the aid of a laboratory to illustrate, at least, fundamental truths, and chemistry cannot be taught without a laboratory. To acquire an accurate knowledge of normal and morbid histology without the microscope is impossible. The same is true of bacteriology.

In the practical branches the objective method is gaining ground. Clinical instruction is the best instruction in these branches. If clinical material were sufficiently abundant to enable the diseases of the several organs to be presented systematically to students in the shape of clinical examples, it would be the ideal plan of teaching. In its absence, the didactic lecture must still be the means of systematic instruction, while the clinic avails for illustration. After all, the didactic lecture is much like a composite picture, the resultant of many details representing the same general condition, and not exactly resembling any of the individuals who have given origin to it. And like the composite picture the didactic lecture is most intelligible to those who are familiar with the originals. The importance of clinical teaching grows apace with improved methods of diagnosis and treatment. Refinements of diagnosis require illustration to make them understood. The existence and flourishing condition of the post-graduate schools for clinical instruction speak louder than all else for more and better clinical instruction by our undergraduate schools.

In the efforts to improve medical education, it should not be forgotten that the prime object of the schools is, or should be, to supply the community with capable, working physicians, and this cannot be accomplished without proper clinical teaching.

IS INEBRIETY A VICE OR A DISEASE?

The attempt to study scientifically the various departures of mankind from the rule of right living, brings up many interesting and difficult questions. When we no longer rest content with the simple fact of the choice of evil rather than good, but seek to know why such a choice is made, the boundaries between vice and disease no longer seem so fixed and definite as they were formerly thought to be. Especially is this true in regard to the subject under consideration. Very few, probably, who have studied the phenomena of drunkenness thoroughly and candidly, look upon the confirmed drunkard as merely the slave of a bad habit. There can be no doubt that the long-continued abuse of alcohol brings about a diseased condition which aggravates the craving for the poison that caused it, and impairs the patient's power of self-control. So far, the question presents little difficulty, and there are probably few in the ranks of the medical profession, at least, who would not agree to the proposition that every drunkard is a diseased person.

When, however, we come to inquire how this diseased condition came about, the question is no longer so simple. Evidence is constantly accumulating that the practice of excessive indulgence in alcohol may itself, in its inception, be a symptom of disease, and the question has now come to be not as to the possibility of such a state of affairs, but as to its frequency.

The *North American Review* for September contains a discussion of the question "Is Drunkenness Curable?" by Drs. W. A. HAMMOND, T. N. CROTHERS, E. N. CARPENTER and CYRUS EDSON, which illustrates, to some extent, the divergence of views on this point. Dr. HAMMOND dwells, almost exclusively, on the influence of habit and opportunity in the making of drunkards. Dr. CROTHERS attributes over 60 per cent. of cases of inebriety to heredity, 20 per cent. to disease or injury preceding the use of spirits, 10 per cent. to brain and nerve exhaus-

tion, 5 per cent. to bad sanitary conditions, and says that "in a small percentage the causes are obscure and unknown," evidently implying that habit, the usages of society and the moral standards of the individual, have nothing to do with the matter. DR. CARPENTER takes the ground that "some men are born drunkards, some achieve drunkenness, and some have drunkenness thrust upon them."

The estimate of DR. CROTHERS as to heredity can be better appreciated in connection with the context. He says: "The parents and grandparents have been continuous or excessive users of spirits, or have been insane or mentally defective, or have been consumptive, or had rheumatism, gout, or some other profound constitutional disease, before the birth of the child." In view of the frequency of most of these conditions, it may be questioned if a majority of healthy persons could not find instances of one or more of them among the six persons included in two generations of ancestors. At the beginning of this century, probably nearly the whole male population of this country, aside from those whose means enabled them to drink wine habitually, could have been properly described as continuous or excessive users of spirits.

Without questioning the reality of the causes mentioned by DR. CROTHERS, it seems to us that habit and custom count for a good deal more than he is disposed to admit. The overwhelming preponderance of the male sex in the inebriates of this country does not seem easy to explain on his theory. Women are as much exposed as men to most of the influences he mentions; no such difference in favor of one sex is observed in other neuroses, nor in regard to the use of opium, and other stimulants and narcotics, in cases in which social influences do not bear with unequal force upon the sexes. The great rarity of drunkenness among the rural population of Mohammedan countries, and its almost universal prevalence in many savage races, so soon as the opportunity is offered, its varying prevalence in different communities, and in the same community at different times, go to show that the part played by pathological conditions in the beginnings of the alcohol habit is a subordinate one. The same thing is indicated by the ordinary course of inebriety. Although there are not a few instances in which a person who has previously been a total abstin-

er or a temperate drinker suddenly develops a tendency to get drunk, as a rule the drunkard begins as a moderate drinker, and the habit grows on him, like other habits, until it becomes one of habitual excess.

The question of the curability of drunkenness is of much less importance than its preventibility. A state of public opinion that would make the sale and consumption of alcoholic drinks thoroughly disreputable would do more than anything else to put an end to the evils of intemperance. Many excellent people would consider the remedy worse than the disease.

THE PUBLICATION OF SECTION WORK.

After the recent meeting of the American Medical Association, it was determined to attempt the publication of the work of each Section in consecutive numbers of *THE JOURNAL*. Fortunately, the committee of arrangements at Washington had prepared the official programme in the order of the original creation of the Sections. This enabled us to take up the work of publication in a proper serial order, beginning with that of Medicine. Up to and including this issue of *THE JOURNAL*, there have been published the papers read before the Sections on Medicine, Obstetrics and Diseases of Women, Surgery, State Medicine, and nearly all of the Section on Ophthalmology. As rapidly as this publication has taken place, the completed Sections have been republished in reprint form, and a few copies distributed to the members who took part in the proceedings by reading papers. This was done as a recognition of their active interest in the scientific work of the Association. It is much regretted that we were not in each instance placed in possession of the complete discussions which took place in the Sections. This will be provided for at the ensuing meeting. Another regret, and one that we have seriously felt, has been the shortness of type in *THE JOURNAL* office, which, in a number of instances, prevented our withholding matter for publication until proofs could be returned by authors of papers. To the uninformed about such matters we will say, a printing office should be restocked with type at the beginning of a new volume. Worn type and new type does not work together when mixed.

The method adopted in the serial publication of Section work does not allow us to give a great variety of matter to our readers in each issue of THE JOURNAL, but it does give to each member of the Association and JOURNAL subscriber a singularly valuable post-graduate course of reading. Subjects and departments in medicine are concentrated in a few numbers, and an opportunity is afforded of making a practical recognition of working members. Not only this, but their papers and discussions are rendered doubly valuable by reason of their easy reference. Those who are engaged in specialty practice will most fully appreciate this method of publication of their Section proceedings. Men who aspire to leadership and excellence in scientific researches will find in the Sections of the American Medical Association an arena that is unequalled as a place for the display of their best thoughts and work.

Specialty societies have their place in the professional field, and from them there are sent forth annual exhibits of studies and clinical observations of the greatest value. Thus it is that, semi-annually, the work of the Sections of the American Medical Association, and the great specialty societies reflect the professional conclusions of the most skilful men in our art. In this way the tally is made in professional progress.

PHYSICAL TRAINING REMEDIAL OF PSYCHICAL OBLIQUITIES.

At the Red Hill Reformatory, England, exists an institution, the aim of which is to improve the mentality and moral sense of young offenders by correcting their physical defects, and is known as "the criminal reform athletic school." A recent report makes a claim that 94 per cent. of the cases, retained a reasonable length of time, are recorded as cured. If the gymnastic reformation of the depraved is to be the treatment of the future, it will do away with the necessity of the remarkable suggestion, recently presented in the *Revue Scientifique*, as being the conception of a Californian physician. He proposes that those cases of mental insufficiency that lead to criminality shall have, by legal enactment, to pay the penalty of castration. He does not dwell much upon the direct or deterrent effects of this penal operation upon the criminal himself; the object to be gained is the prevention of transmitted,

hereditary defects. In other words, the criminally minded should not be allowed to propagate after their kind. The "moral," or fear inspiring, effect upon that class of scoundrels, who contemplate and deliberately plan the rape of children, the beating of their wives, bigamy, and the misleading of the weaker sex—not to specify other nearly equally repugnant forms of cowardly vice—ought to be very marked. Imprisonment has no fears for many of these wretches who come up time after time for trial regarding repetitions of the same offense. The *Press and Circular*, in an editorial comment, seems to favor the extension of castration as a punishment upon house-breakers, but is not in favor of having the morning papers adopting the term "castration," because the police reports, therein printed, would scarcely be "polite reading for the ladies at the family breakfast table." For example, that journal supposes, if Bill Sykes were to come up for sentence, and the verdict might be "that the prisoner be sentenced to ten years penal servitude and to be immediately castrated. This would not do at all; some new word would have to be found for expressing the latter part of the judgment on the irrepressible gentleman who disturbs our households at night."

"M. D., INDIANAPOLIS."

We note in the JOUR. AM. MED. ASSOCIATION, and in several other medical publications, an article with the above caption, in which it is stated that one S. E. L. SMITH, who was arraigned in Birmingham, England, for assuming the title of "M. D., Indianapolis." SMITH produced in court a document which gave him the said title. It was said the document cost SMITH thirty dollars. We have looked over the list of graduates of the two regular colleges of this city, and are prepared to say that neither of those institutions granted the degree. There are two irregular colleges here, and for them we are not prepared to speak; but the regular schools require four years' study and attendance on three courses of lectures of six months each, with preliminary education in the common school branches. The examinations are rigid, and money cannot purchase favors of these institutions.—*Indiana Med. Jour.*

We take pleasure in endorsing all that the editor of the *Indiana Medical Journal* says of the two regular schools of medicine in Indianapolis. Their character and the integrity of their managers is not questioned. Of the other two the

Illinois State Board of Health reports the diplomas of one recognized conditionally, and the other not recognized. The natural inference is that S. E. L. SMITH had a diploma from one of the latter institutions.

CREDITABLE.

The Illinois State Board of Health last week examined a recent graduate of the University of Berlin. This action is in accordance with the regulations of the Board in not recognizing diplomas from institutions in countries where the diploma does not entitle their holders to practice. This specially obtains in regard to Prussia, where the candidate has to pass the Staats Examen. The result in this instance was highly satisfactory, and creditable to the applicant.

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

The Board of Health has for some time been engaged in a thorough investigation of the sources of pollution along the Croton water shed, in consequence of the somewhat unsatisfactory condition of the water, as shown by the analyses made by the chemists of the Board. The two great aqueducts now in use bring to the city a daily supply of about 150,000,000 gallons of water, which comes from Croton Lake, a body of water formed by damming the Croton River a short distance from the point where it flows into the Hudson. The Croton River brings water down into this lake from the hills of Westchester, Putnam and Dutchess counties, and near Croton Falls the river divides into three forks, which are known as the East, Middle and West branches. Each of these is fed by numerous streams and brooks, many of them being of considerable size, and many of them having their independent storage reservoirs. The Muscoot River brings the waters of Lake Mahopac down into the Croton River. The East, Middle and West branches have each their great storage reservoirs, the first having the Sodom Dam and Mud River reservoirs, the second the Middle branch reservoir, and the third the Lake Glendon and Lake Gleneida reservoirs. The storage reservoirs of these three main branches of the Croton River are in turn supplied with the waters of a hundred lakes, small rivers and brooks from the north.

It is certainly as perfect a water-shed as can be found anywhere in this country. Its supply by nature is abundant and pure, and its channels for regulated distribution altogether admirable. But the beautiful country from which this grand supply of naturally pure water springs has, like all beautiful countries, become populated. The centers of population there are rapidly grow-

ing, and it is from this source that the menace to the health of this great city, which depends on this water-supply, comes. The situation is not particularly grave at present, but it is unquestionably likely to become so in the future unless suitable measures are taken in time; and hence it is that it is imperatively necessary that such legislative action should be taken as will protect the interests of New York in this very important matter. In the meanwhile, the city health department is doing all that it can to ward off threatened evils, and at a recent meeting it adopted resolutions calling upon the State Board of Health to cause to be reported as soon as possible to it the names and residences of all persons ill with a communicable disease who reside on the Croton watershed, and also to notify it of all deaths occurring on the water-shed, stating in every instance the cause of death and the residence of the deceased.

The chief engineer of the Croton Aqueduct has also made a report in regard to the contamination of the water supply, and the carefulness of statement which characterizes it is worthy of high commendation. In it, however, the fact is plainly recognized that the greatest danger to the quality of the city's water supply arises from the flow into the tributary streams of liquids charged with refuse matters from the most thickly populated portions of the water-shed. As to the contamination of the water in the reservoirs with organic matter, this is held to be a phenomenon of uniform occurrence in all newly flooded reservoirs. However carefully the ground may be cleaned before flooding, there will be vegetation left whose decay will liberate sulphuretted hydrogen, and so be a source of temporary contamination. Exposure to the air rids the water of the noxious gas, and the organic matter which may be held in suspension is not dangerous. On the whole, the quality of New York water is not altogether what it should be, and what it ought to be made by the interference of suitable legislation; but at the present time, at least, there is in it no serious danger to public health.

The Board of Health's summer corps of visiting physicians, reference to whose work was made earlier in the season, has completed its two months' service in the tenement house districts of the city. During this period these physicians visited over 30,000 houses and families, but it is stated that fewer cases of sickness were found than during any previous summer since this service has been established.

The free excursions of the St. John's Guild Floating Hospital have also now been discontinued for the season. This year no less than five trips a week have been made, a greater number than ever before; the boat starting on three days of the week from landings on the East River, and on two days from landings on the Hudson River. The full capacity of the floating hospital is 1,500, but this large number makes it somewhat crowded, and it usually carries from 800 to 1,100 mothers and children. Of course no cases of contagious disease can be taken, and a physician is always stationed at the gang-plank to see that none such are brought on board. The hospital barge is towed by a tug-boat, and as soon as the start is made most of the children are sent to the capa-

cious upper deck, where they run about and get the full benefit of the salt breezes. The trained nurse in charge of this deck has a watchful eye over all, and circulates among the mothers, giving many useful health hints and suggestions as to the proper care of their little ones. To many of the women she says, "I think baby would be better for a nice salt water bath," and the mother and child go below to the bath-rooms. There are five tubs, five spray baths for children, and two spray baths for women, with another trained nurse in charge of them, and many baths are given during every trip. The worst cases are carefully put to bed in two large, airy rooms on the lower deck, and the most of these are left at the seaside hospital of the Guild, where they remain for ten days or so. Besides the physicians and nurses, the working force of the floating hospital consists of a captain, pilot, six deck hands, watchman, engineer, two cooks, and ten waitresses. Two lifeboats are towed behind, in each of which sits a sailor, on the outlook for any child which may fall overboard.

After an invigorating sail down the beautiful bay and through the Narrows, the boat comes to anchor half a mile from the Seaside Hospital on Staten Island, and the patients destined for this institution are rowed ashore. Those remaining on the barge are then taken downstairs and given a bountiful dinner. The milk used for the children is the purest that can be obtained, and it is carefully sterilized and tested before it is put on board. The Seaside Hospital, which is beautifully situated almost at the water's edge, can accommodate over 250 patients, and the arrangement of the beds in its cool and lofty wards is quite novel. From the foot of the iron bedsteads used by the mothers rise two iron supports which curve above the bed like the davits on a ship, and from these a crib is suspended at right angles to the bed. The sick child thus hangs in the air immediately above its mother, and she can attend to its wants instantly, and without rising from her own bed. There are ten acres of land about the hospital, with a fine cedar grove, and with the most abundant facilities for sea bathing. Other institutions which prove of inestimable benefit to the children of the poor are the Summer Home of the Children's Aid Society, the St. George Sanitarium, and the Summer Branch of St. Mary's Free Hospital for Children, all of which are located on the Long Island sea coast.

P. B. P.

KANSAS CITY LETTER.

Vaginal Hysterectomy for Carcinoma—Insanity Following Rectal Operation—Methyl-violet for Cancerous Growths—A New College Organized—College Notes.

The meetings of the Academy of Medicine have of late been unusually interesting. At the last, Dr. J. F. Binnie, Professor of Pathology in the University, discussed the subject of

VAGINAL HYSTERECTOMY FOR CARCINOMA.

He first presented the history of a case successfully operated upon by himself seven months ago, exhibiting the specimen as well as slides showing the cancerous character of the disease, and then gave a table of 1,169

cases gathered from published reports and from private communication of hitherto unpublished operations; these figures gave a mortality of *less than twelve per centum*, the total number of deaths being only 137—in view of which it takes a bold man to say the operation is unjustifiable because of immediate danger. And the ultimate results are no less satisfactory—in fact they are rather surprising inasmuch as a careful study of cases operated upon years ago shows that *more than 50 per cent. of all cases operated upon permanently recover*. This is a somewhat remarkable showing, but it bears out Schauta's estimate of 47 per cent. permanent recovery and places the operation of vaginal hysterectomy far in advance of many procedures generally accepted as justifiable; for example, amputation of the breast for malignant disease, König's statistics giving only 23 per cent. of recoveries in the latter operation. After a thorough analysis of the subject Dr. Binnie formulated these conclusions:

1. Vaginal hysterectomy is a comparatively safe operation.
2. In many cases vaginal hysterectomy effects an absolute cure. Where it does not do so it generally gives relief from distressing symptoms.
3. The more localized the carcinoma, the sooner should total extirpation be done.
4. When it is surmised, but not positively known, that all the disease cannot be removed, the operation ought to be performed.
5. Adhesions in the upper part of the uterus, when there is cancer in the lower, call for at least, an exploratory laparotomy, and if the adhesions prove to be the result of inflammation, hysterectomy may be made.
6. Superficial extension of the disease over the vagina does not absolutely contra-indicate the operation.
7. Clamps, for the control of hæmorrhage, are probably as safe as ligatures, if antiseptic precautions are vigorously attended to; certainly their application is infinitely easier and more rapid.

Dr. George Halley, in discussing the paper, said he had made the operation in eight cases with but two deaths as the immediate result, and though there has been a return of the disease in two cases the recurrence has been in the mesentery and liver, and life has not been so miserable as it would have been with the terrible pains and offensive discharge of primary uterine carcinoma; besides, life has undeniably been prolonged from one to four years. In two of these cases there has been a radical cure; a number of years have elapsed and there has been absolutely no evidence of return; yet careful microscopic examination shows the disease to have been unquestionably cancerous in both cases. Involvement of the vaginal wall does not necessarily contra-indicate operation as in one case the vagina was extensively infiltrated and death would undoubtedly have occurred in a few months, but careful dissection of all affected tissues and vaginal extirpation prolonged the life of the patient almost three years; she died with but little suffering—always thankful for the temporary relief from horrible distress.

INSANITY AFTER RECTAL OPERATION.

Dr. Emory Lanphear lately reported to the Academy

the case of a woman, aged 40, suffering from pyosalpinx, and had hæmorrhoids with fissure; her general condition was bad—the patient nervous and emaciated, and troubled with obstinate constipation and some insomnia. She was put in the hospital for some weeks and improved greatly, the appetite becoming good, sleep excellent, bowels regular and loose, and the strength quite satisfactory—so an operation on the rectum was deemed advisable. Under chloroform, Dr. Lanphear removed the entire lower part of the rectum, with some hard, infiltrated connective tissue surrounding it, pulling healthy muscular membrane down to cover the denuded surface; iodoform was applied freely and the bowel packed with iodoform gauze, bichloride gauze and cotton over outside. She was put to bed without shock and with no subsequent bad symptom, such as pain, rise of temperature, &c. The wound healed by first intention everywhere except at one point where there was pus formation.

On the fifteenth day there was still some pus discharging, and considerable pain at stool, but patient had been gaining at least a pound daily in weight, the temperature was normal, bowels regular, and sleep satisfactory without hypnotics. The next day she became despondent, crying much; the next there was considerable incoherence with the melancholia, but under twenty grains of bromide of sodium she slept nine hours. The next morning she was a perfect picture of dementia; the next day she was somewhat excited but passed into a stupid condition soon. The next morning she was apparently unconscious, pulse 60, respiration 16, and temperature normal; she swallowed food (milk and milk punch) and took medicine nicely during the day. In the evening she was seen by Prof. J. M. Allen, also; he gave an unfavorable prognosis as he had some years ago a case of insanity following operation for fistula in which there was a fatal termination, with no discoverable cause. The next day witnessed no improvement; she began menstruating in the afternoon, and exhibited some evidence of pain and ovarian tenderness under pressure; temperature $99\frac{1}{2}^{\circ}$ F. On the next day the temperature began to rise, the respiration ran up to 56 per minute and marked emaciation became manifest. The record for the next morning was: temperature $103\frac{1}{2}^{\circ}$ F., pulse 140 and respiration 144 per minute! Of the accuracy of this observation, Dr. Lanphear said there would be no doubt as it was repeatedly verified during the next 30 hours, the patient dying at 2 P.M., of the following day. No autopsy was obtainable. The probabilities are that the mental disturbance and subsequent cause were due to septic poisoning, but if so the manifestations of septicæmia were of a very peculiar character to say the least. One theory advanced was that the nerve-centers gave way simply from the reflex irritation coupled with the effect of the anæsthetic; in 20 cases of removal of the uterine appendages reported here some two or three years ago, insanity followed within a few days after operation—and one case has become hopelessly demented. Whether the case here mentioned could have proven an instance of post-operative insanity if the woman had lived is a question for speculation.

ANILINE DYES FOR CANCER.

Methyl-violet, after the method advocated by Moosetig-

von Moorhof, is being extensively tried in this city for the cure of inoperable malignant growths. One case under the care of Dr. J. W. Perkins of St. Margaret's hospital showed some improvement and marked immunity from pain after each injection; the growth—sarcoma—was most painful, necessitating the hypodermic use of a half grain of morphine every four hours, but the patient was able to go from sixteen to twenty-four hours with no morphine whenever the pyoktanin injections were made.

Other cases under Drs. Fulton, Block, Griffith, Binnie and others at St. Joseph's, All Saints', the German and City Hospitals have shown wonderful results. At the Academy, Dr. J. D. Griffith, Professor of Surgery in the K. C. Medical College, recently reported seven cases in which he had used the drug. Of the seven cases one died, two were (apparently) completely cured—patients exhibited to the Academy—and all the others are improving. Two cases were epithelioma of the face, one epithelioma of the cervix, one osteo-sarcoma of the upper and lower jaw, one adeno-sarcoma of the side of neck and face, the other two were sarcomatous tumors, inoperable. One of the cases presented adeno-sarcoma is 27 years of age, came under treatment some weeks ago, for a very large tumor of the right side of the face and neck; it was of a slow and painful growth, and presented all the symptoms of malignant growths of glands, and examination showed it to be a true adeno-sarcoma, involving the parotid and submaxillary glands. Treatment was begun by injecting twenty minims before and behind, the solution being 1 to 500, carefully sterilized, the face being thoroughly cleansed by antiseptic solutions to prevent the introduction of any material which might cause suppuration. The injections were repeated every other day and rapidly increased in quantity. In two weeks the tissues began to break down; the fluid contents were carefully aspirated and the injections continued, care being taken to throw the solution into the tissues around and not into the cavity in the growth. The tumor rapidly diminished in size as the injections were repeated and the quantity of fluid increased; at last three drachms of the solution were used every second day. There *never* was any pus present, the fluid withdrawn consisting simply of serum, broken down connective tissue, a few leucocytes and many cancer cells; the most careful examination failed to show any staphylococci or streptococci of suppuration. Soon the tumor shrank to almost nothing and now presents no trace of the malignant disease that promised to end his life in a short time.

The other case shown [osteosarcoma affecting the molar, superior maxillary and inferior maxillary] was treated in the same way, but with more difficulty, owing to the extreme hardness of the tissues; as only a few drops could be deposited in one place, many punctures had to be made and never could more than sixty minims be injected at one sitting; yet cure is seemingly complete.

In the fatal case, operation had been made some months ago for small epithelioma of the lip. An immense secondary growth sprang up, which, when patient was admitted to the hospital, hung down upon his breast; the parotid gland upon the left side was implicated as were all the glands along the sterno-cleido-mastoid. Upon the lower end of this enormous tumor there was a large ulcer to which some quack had been applying fresh frogs' skins (!) allowing them to remain until the stench would become intolerable. The man was suffering intensely, could not sleep, or eat, and had marked symptoms of septicæmia. But treatment was instituted by the usual injections, only in larger quantities—160 minims being finally used—and painting the ulcer with

the pure stick methyl violet [Merck]. The injections were made near the junction of the cancer with healthy skin as the solution could not be thrown into its body. The odor immediately disappeared, but in a few days the mass began to slough and on the day of death the entire mass dropped off leaving the face perfectly clear and free from cancerous tissue. Had the man not died from exhaustion and septic poisoning he probably would have been cured.

The question naturally arises whether this method of treatment is not, after all, about the same as that of Marsden's paste, the ointment of sorrel, etc., used by "cancer doctors." Instead of being applied externally, it is injected, causing death of the malignant growth without suppuration, simply because it is used hypodermically. The sloughing in Dr. Griffith's last case presents the clinical aspects of cancers treated by means of paste. It is not at all unlikely that pyoktanin has no specific action, and that the same result might be obtained by the injection of a strong infusion of either *Oxalidea acetosella* or *Rumex-acetosa* ["horse-sorrel"], or even of binoxalate of potash or oxalic acid. S.

MISCELLANY.

MEDICAL SOCIETY OF VIRGINIA.—The twenty-second annual session of the Medical Society of Virginia will convene in the hall of the Young Men's Christian Association, in the city of Lynchburg, Va., at 8 P. M., Tuesday, October 6th, 1891, and will continue in session through Wednesday, Thursday, and probably a part of Friday.

On entering the hall each Fellow, Honorary Fellow, Fraternal Delegate and Invited Guest should register his name, postoffice, etc., in the book for that purpose, which will be on one of the desks of the Recording Secretary.

Tuesday night's session will be open to the public. It will be called to order at 8 P. M. by the President, Dr. William W. Parker, of Richmond, Va. After prayer, the address of welcome will be delivered by Dr. H. Gray Latham, of Lynchburg, Va.

The address to the public and profession will then be delivered by Dr. Chas. M. Blackford, of Lynchburg, Va., his subject being "Medical Education as It Was; as It Is; and as It Should Be."

The Committee on Nomination of Applicants for Fellowship will make their report, and at once the vote will be taken on the nominations. Each gentleman, as soon as elected, becomes a Fellow, and is entitled to all the privileges and benefits of the Society.

Such other business of a general character as can be disposed of may then be introduced, including motions or resolutions that have to be referred to committees, reports of officers, announcements, etc.

Ex-President and Honorary Fellow, Hunter McGuire, M.D., LL.D., etc., of Richmond, Va., during the last session, authorized the announcement that he would offer a prize of one hundred dollars for the best original essay on pyelo-nephritis, presented by a Member or Fellow of either of the State Medical Societies of Virginia, West Virginia or North Carolina, of each of which he is an Honorary Fellow. All essays offered in competition must be considered as under the control of the Medical Society of Virginia or its Committee on Publications. The essay to which the prize is awarded will be published in the transactions of the Medical Society of Virginia and in such regular medical journals as may desire it.

The conditions of the competition are that the competing essays must be in the hands of the Recording Secretary of the Medical Society of Virginia by the first day of September, 1891. They must be type-written or printed. Each one must be designated by a motto on MS. (not by the author's name or other mark by which

the identity of the author is made known), and accompanied by a sealed envelope, with the adopted motto on the outside, and a card inside, giving the name and post-office address of the author. In advance of the session, the several competing essays are to be examined by a committee appointed by the President of the Medical Society of Virginia. This committee will report the two best essays in their hands, each of which is to be read before the Society, and the prize will be awarded to the one that a ballot vote may determine to be the best.

It is understood that either the Examining Committee or the Society shall have power to determine whether or not either of the essays possesses sufficient merit to entitle the author to the prize.

The following resolution, introduced last year (see Transactions 1890, pages 291-295), requires action during this session:

By Dr. George T. Walker, of Vinton:

Resolved, That the President of the Medical Society of Virginia appoint a committee, consisting of three Fellows, to consider the practicability of designating a time during each annual session, for the holding of clinics, and for clinical instruction, and report at the next annual session.

Committee on above: Drs. Geo. T. Walker, A. C. Palmer and Wm. T. Walker.

Practically bearing on the same subject, Dr. J. N. Upshur of Richmond moved (see Transactions 1890, page 311), that a committee of three Fellows be appointed, to report during the session of 1891, as to the propriety of recommending that a portion of some day of each annual session be set apart for the reports of cases, asking advice, etc.

Committee: Dr. J. N. Upshur, of Richmond; Honorary Fellow Dr. J. L. Ashton, of Dallas, Texas, and Dr. Thomas P. Mathews, of Manchester, Va.

During the session of 1890 (see Transactions 1890, pages 292-295), Dr. Hugh M. Taylor, of Richmond, Va., introduced a resolution to do away with the present system of annually appointing Reporters on Advances in the several departments of medical science, and in lieu thereof select annually some subjects for full investigation and discussion during the succeeding annual session, appointing several Fellows to report on given subdivisions of the subjects, so that the several reports or papers by different authors, when systematically arranged for publication in the Transactions, will practically form one continuous treatise or monograph on each of the several subjects so selected.

After full discussion, on motion by Dr. J. F. Winn, of Richmond, a committee of five Fellows was ordered to appointed to take the whole subject under advisement and report during the annual session of 1891.

The President appointed Drs. J. F. Winn and Hugh M. Taylor, of Richmond; I. S. Stone, of Washington, D. C.; Honorary Fellow Dr. Benjamin Blackford, of Staunton, and Dr. John Grammar, of Halifax C. H.

On Wednesday morning, October 7th, at 10 o'clock, the Society will be called to order. Business of a general character will be in order until 11 o'clock, when the President, Dr. William W. Parker, of Richmond, will deliver the annual address of the President.

The subject for general discussion, Acute and Chronic Dysentery, will then be called. The subject will be opened by a paper by the leader, Dr. P. B. Green, of Wytheville, Va. Dr. Wm. J. Crittenden, of Unionville, Va., will follow with a paper having the same title. Honorary Fellow Dr. Bedford Brown, of Alexandria, Va., will follow with a paper on "Dysentery Viewed as a Septic Disease, and Treated by Antiseptics." After this paper, the discussion will be open to Fellows, Delegates and Invited Guests, in the order of their recognition upon the floor by the chair, the right of closing the discussion being accorded to the leader, Dr. Green.

The afternoon meeting will be consumed in the election of officers, including the nomination to the govern-

or of one to fill the place of Dr. T. M. Bowyer (resigned) on the medical examining board of Virginia from the sixth congressional district; the selection of the subject for general discussion during the twenty-third annual session, and the leader in the discussion; the election of a Fellow to deliver the annual address to the public and profession; the selection of place and time for holding the twenty-third annual session, etc.

The meeting at night will be called to order at 8 P.M.

Reports on Advances in the Respective Departments of Medicine and Surgery will be called for in the following order, and continued as the order of business through Thursday, or until completed:

1. *Anatomy and Physiology*.—Dr. Paul B. Barringer, of University of Virginia, reporter.

2. *Chemistry, Pharmacy, Materia Medica and Therapeutics*.—Dr. Benj. Harrison, of Richmond, Va., reporter. In this Section the following papers will be read:

(a) The Place of the Turkish Bath in the Treatment of Disease. By invited guest, Dr. Charles H. Shepard, of Brooklyn, N. Y.

(b) Pharmacy and Its Practical Relation to the Profession. By Dr. S. J. Baker, of Bedford City, Va.

3. *Obstetrics and Diseases of Women and Children*.—Dr. Herbert M. Nash, of Norfolk, Va., reporter. In this Section the following papers will be read:

(a) Puerperal Eclampsia; Its Etiology and Treatment. By Dr. J. T. Graham, of Wytheville, Va.

(b) Etiology and Pathology of Puerperal Inflammations, illustrated with specimens. By invited guest, Dr. Thomas A. Ashby, of Baltimore, Md.

(c) Retro Displacements of the Uterus. By fraternal delegate from Medico Chirurgical Faculty of Maryland, Dr. H. P. C. Wilson, of Baltimore, Md.

(d) Recognition of Operative Cases in Gynæcology by the General Practitioner. By invited guest, Dr. Joseph Hoffman, of Philadelphia.

(e) Remarks on Salpingitis and Peritonitis—the Result of Gonorrhœal Infection. By honorary Fellow, Dr. George Tucker Harrison, of New York, N. Y.

4. *Practice of Medicine*.—Dr. Lewis E. Harvie, of Danville, Va., reporter. In this Section the following papers will be read:

(a) Importance of the Microscope to the General Practitioner as an Aid to Diagnosis and Correct Medical Treatment, with some Demonstrations in Bacteriology. By fraternal delegate from the Medical Society of Tennessee, Dr. James E. Reeves, of Chattanooga, Tenn.

(b) Hæmorrhoids and Their Treatment. By Dr. J. N. Upshur, of Richmond, Va.

(c) Symptomatology and Treatment of the Chronic Forms of Nephritis. By Dr. William C. Dabney, of University of Virginia.

5. *Surgery*.—Dr. Thomas M. Bowyer, moved to Sioux Falls, S. Dak., reporter. In this Section the following papers will be read:

(a) Present Aspect of Cerebral Surgery. By invited guest, Dr. Landon Carter Gray, of New York, N. Y.

(b) Perineal Operations. By invited guest, Dr. Joseph Price, of Philadelphia, Pa.

(c) Concussion of the Lungs. By invited guest, Dr. B. A. Watson, of Jersey City, N. J.

(d) A Successful Myomectomy for Parasitic Tumor. By Dr. I. S. Stone, of Washington, D. C.

(e) A Plea for Closer Study of the Principles of Surgery by the General Practitioner. By Dr. Geo. Ben. Johnston, of Richmond, Va.

(f) Some Subject Connected with Orthopædic Surgery. By invited guest, Dr. A. M. Phelps, of New York, N. Y.

(g) Treatment of Goitre by Electrolysis. By Dr. Thas. M. Shields, of Richmond, Va.

6. *Ophthalmology, Otology and Laryngology*.—Dr. J. Herbert Claiborne, Jr., of New York, N. Y., reporter.

[Dr. Claiborne will report on Ophthalmology. Dr. John Dunn, of Richmond, Va., has been appointed by

the president, by request, to report on Otology and Laryngology.]

In this Section the following papers will be read:

(a) Ophthalmology in Ancient Egypt. By Dr. W. H. Baker, of Lynchburg, Va.

(b) Some Personal Observations on Cataract Operations. By invited guest, Dr. A. W. Calhoun, of Atlanta, Ga.

(c) Mistaken Impressions about So-called Nasal Catarrh. By Dr. Joseph A. White, of Richmond, Va.

(d) Some Suggestions about Cataract Operations. By Dr. Joseph A. White, of Richmond, Va.

7. *Neurology and Psychology*.—Dr. William F. Drewry, of Petersburg, Va., reporter. In this Section the following papers will be read:

(a) Hereditary Chorea. By invited guest, Dr. Wharton Sinkler, of Philadelphia, Pa.

8. *Hygiene and Public Health*.—Dr. W. T. Oppenheimer, of Richmond, Va., reporter. In this Section the following papers will be read:

(a) The Drink Problem from a Medical Point of View. By invited guest, Dr. T. D. Crothers, of Hartford, Conn.

(b) The Drink Problem from a Medical Point of View. By Dr. Frederick Horner, of Marshall, Va.

(c) What is to be Done with our Criminal Lunatics? By Dr. J. T. Graham, of Wytheville, Va.

Several gentlemen have indicated their intention to present papers, but do not authorize the Executive Committee to announce the fact. Hence all such papers as may hereafter be prepared will be classified as Voluntary Papers, and will be called for in the order of their presentation after the completion of the above arranged order.

By a resolution adopted in 1884, not more than thirty minutes is allowed to the reading of any paper, whatever may be the length of manuscript, and extempore remarks must not exceed fifteen minutes.

The Medical Examining Board of Virginia will hold a semi-annual meeting in Lynchburg October 6th, 1891, at 8 P.M., preliminary to the examination of candidates (to begin next morning), for license to practice in Virginia. All letters of inquiry about this board should be addressed either to its Secretary, Dr. Paulus A. Irving, of Farmville, Va., or to its President, Dr. Hugh M. Taylor, of Richmond, Va.

The Local Committee of Arrangements, Dr. C. E. Bussey, of Lynchburg, Va., Chairman, is using every effort to make this session one of special pleasure and profit to those who may attend.

The Committee on Accommodations, Railroads, etc., Dr. John W. Dillard, Lynchburg, Va., Chairman, reports the following hotel rates:

Norvell-Arlington Hotel, corner of Church and Eighth streets, \$2.25 a day.

Lynch Hotel, corner Main and Ninth streets, \$2 a day.

National House, Main, between Ninth and Tenth streets, \$1.50 a day.

Railroad Rates.—Baltimore & Ohio—Card orders from points in Virginia to Staunton or Lexington at two cents a mile each way. Fellows, Delegates, etc., needing orders over this railroad, to secure tickets, should write at once to the Recording Secretary of the Society.

Chesapeake & Ohio—Round trip tickets from all principal points to Lynchburg or to Charlottesville, four cents a mile. If by way of Charlottesville, add \$3 to secure round trip from Charlottesville to Lynchburg and return, ticketing through to Lynchburg.

Richmond, Fredericksburg & Potomac R. R.—From Quantico and intervening depots to Richmond and return, about four cents a mile, round trip, according to "Special Round Trip Excursion Tariff," in effect since February 1st, 1890.

The Norfolk and Western, the South Atlantic and Ohio, the Richmond and Danville, the Lynchburg and Durham, the New York, Philadelphia and Norfolk, the Atlantic Coast Line, the Atlantic and Danville, will

charge five cents a mile, round trip, to connecting points. These rates are, in general, about the usual summer excursion round-trip rates.

The exhibition of surgical instruments, pharmaceutical preparations, etc., promises to be more than usually attractive. Parties wishing space should apply to the Chairman of the Committee on Exhibits, etc., Dr. Frank Camm, of Lynchburg, Va.

The number of applications for Fellowship received indicates that the addition to the membership will be very large. Fellows should induce their eligible friends to forward their applications at once.

Fellows should forward amounts due to the Treasurer, Dr. Richard T. Styll, Hollins, Roanoke county, Va., which is a postoffice money-order office, until October 5th; after that to Lynchburg.

HUNTER MCGUIRE, M.D.,

Chairman Executive Committee, Richmond, Va.

LONDON B. EDWARDS, M.D.,

Recording Secretary, etc., Richmond, Va.

AMERICAN PEDIATRIC SOCIETY.—The third annual meeting of this Society will be held in Washington, September 22, 23, 24 and 25, 1891, at the Arlington Hotel, Vermont Ave. and H St., Parlor 206.

President—T. M. Rotch, M.D., 197 Commonwealth Ave., Boston, Mass. First Vice-President—V. C. Vaughan, M.D., Ann Arbor, Mich. Second Vice-President—Joseph O'Dwyer, M.D., New York City. Treasurer—Charles Warrington Earle, M.D., 535 Washington Bd., Chicago, Ill.

Physicians are cordially invited to be present.

Tuesday, September 22, 8 P.M.

Reading of minutes of last meeting. General business.

1. Address of the President.

2. How to prevent Complications and Sequelæ in Scarlet Fever, J. Lewis Smith, M.D., New York.

3. Discussion on the Diagnosis of Pneumonia in Infancy and Early Childhood.

a. The most diagnostic symptoms of the early stage of lobar pneumonia, and the differential diagnosis from such diseases as Meningitis, Malaria, Scarlet Fever, etc. T. S. Latimer, M.D., Baltimore.

b. The diagnosis of consolidation of the lung from effusion (serous or purulent), and the differential diagnosis between Lobar Pneumonia and Broncho-Pneumonia, F. Forchheimer, M.D., Cincinnati.

c. The diagnosis of Broncho-Pneumonia (acute and chronic), from Tuberculosis, William Osler, M.D., Baltimore.

d. The diagnosis of Broncho-Pneumonia from Bronchitis, also the Temperature Range in Acute Pneumonia, both Broncho and Lobar, L. Emmett Holt, M.D., New York.

e. Remarks by A. Jacobi, M.D., New York, and by W. P. Northrup, M.D., New York.

f. General Discussion.

Wednesday, September 23.

9 A.M. Breakfast with the President at the Arlington.

11 A.M.—2 P.M.:

I. Demonstrations.

a. A Specimen of Congenital Heart Disease, William Osler, M.D., Baltimore.

2. Manifestations of "La Grippe" in Children, Charles Warrington Earle, M.D., Chicago.

3. The Treatment of Laryngeal Diphtheria by Calomel Sublimations, Dillon Brown, M.D., New York.

4. Further Report on Submembranous Local Treatment in Pharyngeal Diphtheria, A. Seibert, M.D., New York.

5. A Case of Ulcerative Catarrhal Dysentery, W. D. Booker, M.D., Baltimore.

6. Stricture of the Oesophagus occurring in Children, with Report of a Case, F. E. Waxham, M.D., Chicago.

7. A Case of Pulmonary Abscess—operation and re-

covery, with remarks, Francis Huber, M.D., New York Thursday, September 24, 9 A.M.—2 P.M.:

I. Demonstrations.

a. Exhibition of Laryngeal Tubes for the Performance of Forcible Respiration, J. O'Dwyer, M.D., New York

2. A Study of Fifty Cases of Chorea, Samuel S. Adams M.D., Washington.

3. A Study of 140 Cases of Heart Disease in Children (by invitation), Floyd M. Crandall, M.D., New York.

4. Dysentery in a Boy of 11 years—presence of Amœba Coli, H. Lafleur, M.D., Baltimore.

5. Scorbutus in Children, W. P. Northrup, M.D., New York.

6. Chronic Nephritis in Children, Henry Jackson M.D., Boston.

7. Two Cases of Acute Primary Nephritis in Infants L. Emmett Holt, M.D., New York.

8. Scarlatinal Nephritis in Children, J. Lewis Smith M.D., New York.

9. The Application of Gavage in the Treatment of Uncontrollable Vomiting in Infants (by invitation) Charles G. Kerley, M.D., New York.

10. The Association of Congenital Wry-neck and Facial Herniopathy, William Osler, M.D., Baltimore.

11. Tubercular Ostitis of the Hip, originating in Colorado, John M. Keating, M.D., Philadelphia.

12. A Case of Slow Heart in an Infant, terminating in Fatal Syncope, A. D. Blackader, M.D., Montreal.

8 P.M. Dinner at the Arlington.

Friday, September 25.

9 A.M. Report of Committee of Council on Nominations for Office and Membership.

12 M. Executive Meeting.

1. The Etiology of Stomatitis Aphthosa, F. Forchheimer, M.D., Cincinnati.

2. Perityphlitis in the Young, J. Henry Fruitnight M.D., New York.

3. Intussusception, L. Emmett Holt, M.D., New York

4. A Case of Congenital Cretinism, C. W. Townsend M.D., Boston.

5. A Further Contribution to Cirrhosis of the Liver in Childhood, with Post-mortem Notes and Microscopic Studies, W. A. Edwards, M.D., San Diego, Cal., and W. M. Gray, Microscopist, Army Medical Museum, Washington, D. C.

The reading of papers will be limited to twenty minutes.

Members expecting to be at the breakfast on September 23, are requested to notify the President (Dr. T. M. Rotch, 197 Commonwealth Ave., Boston) of their intention on or before September 15.

W. D. Booker, M.D., Secretary, 851 Park Ave., Baltimore, Md.

[Members will please take notice that the correct hour for holding the Pediatric Sessions are those stated in the Programme, and not necessarily as may appear in the general programme of the Congress, which will also be sent to them, and which were merely provisional.]

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from August 29, 1890 to September 11, 1891.

Major Samuel M. Horton, Surgeon U. S. A., is relieved from further duty at Ft. Adams, R. I., and will proceed to San Diego, Cal., and report to the commanding officer for duty at that post.

Capt. L. W. Crampton, Asst. Surgeon U. S. A., is granted leave of absence for fifteen days.

Surgeon David L. Huntington, Surgeon Henry McElderry, Asst. Surgeon Walter Reed, Asst. Surg. Charles M. Gandy, appointed members of a board of medical officers to meet in New York City October 1, 1891, for examination of candidates for admission into the Medical Corps of the Army.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Two Weeks Ending September 12, 1891.

Surgeon Howard Wells, ordered to special duty in fitting out the new naval hospital at Portsmouth, N. H.

Surgeon Jno. H. Hall, ordered before the Retiring Board, September 19.

Surgeon Jno. W. Ross, ordered, in connection with present duty, member of Board on Labor Employment.

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No. 13.

ORIGINAL ARTICLES.

ORTHOPEDIC SURGERY AS A SPECIALTY.

The President's Address, delivered before the American Orthopedic Association at Washington, D. C., Sept. 22, 1891.

BY A. B. JUDSON, M.D.,
OF NEW YORK.

A flourishing medical society sometimes divides into Sections. It is an involuntary process, or at least one to which the members are forced by the necessity of thoroughly accomplishing the objects of the society. The process may be called an analysis. In the present instance, however, if I understand the organization of the Congress of American Physicians and Surgeons, we have a synthesis. A number of societies voluntarily combine to secure ends which were not contemplated at the beginning of each. A division of labor having been made, according to which each society has its special work to do, it is proper and useful for the societies to meet together for co-operation. Let us, therefore, briefly consider some of the salient features which mark our specialty of orthopedic surgery. A better knowledge of ourselves will put us in more quick relation with other workers, both general and special, and enable us better to do our humble part in the grand plan.

In common with other specialists we occasionally hear that we are limited in the possible range of our achievements. The limitation is, however, entirely voluntary, and the work within these limits is practically inexhaustible. If we were not so busy, we might perchance be troubled because we are not always and exactly understood. The sign before an orthopedic hospital in New York is supposed by some of the passers-by to indicate a homœopathic institution. I am probably not alone in having been asked to perform the minor surgical operations of the chiropodist. Many, even among the learned, suppose that the latter part of our name is derived from the Latin word for *foot*, instead of from the Greek for *child*. We are also confounded in the minds of some with the instrument-makers. I mention these things in passing, without a serious thought. If they exist, like morning mist, they will pass away.

It is well, however, to recognize the fact that our practice is comparatively lacking in popular qualities. We have no critical, capital, or brilliant operations. What of brilliancy is there in keeping a limb in such an attitude that the weight of the body in locomotion shall be a favorable, instead of an unfavorable agent, until the natural growth of the member results in comparative symmetry; or in controlling the environment of the diseased joint and the patient, so that the natural processes of recovery and repair shall have their triumph, while the limb is daily growing in symmetry and ability with the growing child? This is not bold surgery, but there is great pleasure in watching and reverently assisting these constantly recurring natural miracles. And will any of us forget the delightful friendships made among our little patients, their pretty bashfulness, their ready confidence, their irrepressible cheerfulness, their graceful acceptance of what is, alas, inevitable? The combination in them of childish and heroic qualities is a daily wonder. To watch them at play is like a dream in which the birds and wild flowers are enacting a tragedy and improving the precepts of Stoic philosophy.

Our practice is not only lacking in brilliant achievements, but it is also uninviting, because, as a rule, our patients do not make absolute recoveries. There is always, or nearly always, a residuum of disability and deformity, and in this is to be found, perhaps, one reason why our specialty has existence; for what general practitioner would lightly assume the care of a case so exceptional in his practice, and so momentous as those which fall into our specialty?

The why and the wherefore of specialties, in general, and ours, in particular, are questions of interest. Some will say that we have a natural aptitude for mechanics, an inherited preference for slow and sure methods, compared with those that are quick and uncertain, or an inborn reverence for what is physically demonstrable. These personal characteristics may explain why some of us are orthopedists, but I believe the reason why our specialty exists and thrives is to be found in the desire of the public, the final arbiter, that experts should be invited to bear the responsibility of orthopedic cases.

One very attractive feature of orthopedic practice is its *reality*—for want of a better word. It is especially the domain of physical demonstration, where the acceptance of pathological doctrine, as well as therapeutic precept, must be preceded by absolute proof. Here subjective symptoms are forgotten in the presence of objective signs. The data for diagnosis are visible, palpable and measurable. Treatment is by forces whose action is nicely directed, increased, diminished, and accurately measured. The very weight of the body is duly considered in trauma and therapeutics, and finally the results of treatment are recorded in degrees of a circle and fractions of an inch. Dealing thus, as we do, with physical realities, it is well for us to keep our eyes open to the moral verities also, which no less form part of the tissue of our daily professional work. Let us remember that diligence is the price of success, and that the only desirable success is that which is reached by the rejection of error and the loyal recognition of truth.

Since our last meeting, there has occurred the death of one of our Corresponding Members, whose hostility to error might in all friendly criticism be called intemperate—one whose diligence and devotion to the interests of his patients make him an exemplar worthy of our affectionate remembrance. But I will not trespass on the subject of the first paper of our session, which is by Dr. A. J. Steele, of St. Louis, on the orthopedic work of the late Mr. Thomas, of Liverpool.

FLUORESCEIN AND FLUORESCIN.

Read in the Section of Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5-8, 1891.

BY FRANK TRESTER SMITH, A.M., M.D.,
OF CHATTANOOGA, TENN.

These recent additions to our *materia medica* are closely allied chemically, both being products in the distillation of coal tar.

They are of use from their faculty of coloring abraded surfaces of the cornea, thus enabling us to locate such abrasions rapidly and accurately. To the oculist this is of but little assistance, as he can readily diagnose these conditions by the methods now in use, and yet in some cases it is of assistance even to him, as in the extraction of small foreign bodies where we must get the substance between us and the iris, or against the black pupil. In these cases, the green ring around the offending material enables us to see it in any position. Likewise, in cases where we have much photophobia, we can tell more quickly and easily to what extent the cornea is involved.

In no other condition than that of abrasion of the cornea is any effect seen, and the action of the solution is limited to the corneal tissue.

Thus, it will discolor the cornea in traumas with or without a foreign body being present, and in ulcers of the cornea. In interstitial keratitis it has no effect, also in inflammations of the other structures of the eye. In two cases of glaucoma no effect was produced, as has been claimed by some.

From the foregoing, it will be seen that it will be most serviceable to the general practitioner who is not accustomed to these cases.

Another use to which I want to call your attention especially, and to which I have seen no reference in any of the articles that have been published on this subject, is in testing whether a stricture of the nasal duct is impervious or not. The needle of a Knapp's lachrymal syringe is inserted into the punctum, and the solution forced through the canaliculus into the lachrymal sac. If there is the least opening through the stricture, some of the green solution will be found in the nose and can be blown out on the handkerchief. The diagnosis is thus much easier than when a clear solution is used.

Its use has been suggested as a sign of death, as the cornea of the dead will take the staining, while that of the living will not, except in the conditions before mentioned, and then the cornea would be but partially discolored.

Most writers have used only fluorescein, and some have failed to get the effect from fluorescin, but in my experiments I have not been able to see any difference between the two drugs.

Fluorescein is a light brownish-yellow powder, insoluble in cold, very slightly soluble in hot water, but more freely soluble in an alkaline solution; the addition of gr. vijss sodium bicarb. dissolving 10 grs. in an ounce of water. This is the solution in common use. It is of a dark brown color. The addition of water turns it green, and from the surface we get a beautiful fluorescence.

Fluorescein is manufactured by heating resorcin and phthalic anhydride to 195° or 200° C. (385° to 392° F.). It is of acid reaction. When freshly precipitated it is readily soluble in ether and alcohol, not so easily when crystallized. Acids may be present as impurities, and are readily detected by greater solubility.

Fluorescin is a yellow powder made by heating fluorescein with a solution of caustic soda and zinc dust. In solubility it is similar to fluorescein, into which it is readily converted by oxidizing agents.

Gr. vjss sodium bicarb. dissolves gr. x in an ounce of water. The solution is dark brown and turns green on the addition of water, with fluorescence. Its behavior on the abraded cornea is exactly similar to that of fluorescein.

In conclusion I would say that we have here agents of some value, especially to those not accustomed to eye affections.

The solutions are not painful in the least, either to the normal or to the inflamed eye. They are also non-irritating. I have used them in cases where the eyes were so irritable that no solution except salt water or a solution of boracic acid) could be borne without pain and increased redness, and there was not the slightest irritating effect.

There are no bad after-effects. The coloring matter is gradually diffused through the corneal tissue and absorbed, this taking from one to several hours according to its amount.

They are of value only in diagnosing corneal abrasions (ulcers, foreign bodies, abrasions), while in other affections their effect is *nil*.

As a sign of death the solutions may have a proper place.

In testing the permeability of strictures of the nasal duct it is of assistance.

In my experiments I am indebted to Mr. F. Voigt and to Dr. R. L. Randolph for courtesies shown. Mr. Voigt worked out the solubilities and furnished the facts concerning the pharmacology of the drugs.

AN EXPERIMENTAL STUDY OF THE COMPARATIVE MYDRIATIC EFFECT OF ATROPIA AND HOMATROPIA.

Read in the Section on Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY HORACE M. STARKEY, M.D.,
OF CHICAGO, ILL.

Among the notable "anomalies of refraction" in the few years just past is the great divergence of opinion among ophthalmologists as to the comparative reliability of atropia and homatropia as mydriatics. It has been surprising to read the varying statements of different well-qualified observers as to the effect produced by the former of these agents; and particularly surprising is it to those who use homatropia with satisfaction to themselves and to their patients to find this drug pronounced absolutely unreliable. It is unnecessary to mention particular articles on the subject. We all recall many such. We also, many of us, recall the discussions that have occurred in this Section for several years past, and particularly at the meeting last year, when the discussions constantly returned to two topics, upon each of which the greatest diversity of opinion existed—namely, the advisability of correcting low degrees of astigmatism and the value of homatropia. On the latter question the members present seemed to be about equally divided between three opinions, all maintained with equal positiveness and tenacity. The first held that for suspending accommodation homatropia is utterly unreliable, and never should be used; the second, that it is generally reliable, and may, in

practically all cases, be used instead of atropia; while the third held the intermediate ground that while homatropia has a wide range of usefulness, there is quite a proportion of cases in which it is insufficient to paralyze accommodation. At that time the writer mentioned an anomalous case occurring in his own practice in which atropia, used thoroughly for a week, failed to relax accommodation, and in which the additional use of homatropia four or five times within an hour caused entire suspension of that function.

These opinions cannot all be correct, and it would seem that sufficient careful experiment and observation should definitely settle the value of this or any drug. There is no doubt as to the superior availability of homatropia in diagnosis if only it can be used with certainty.

To assist in establishing the place which homatropia should hold as a mydriatic, the writer has, during the past year, made a number of careful observations.

These observations have been made upon young patients seen in private practice, and for the most part upon cases presenting the most difficult features for examination.

A few of these, owing to the short stay of the patient in the city, or from some other unavoidable cause, are not as complete as desired, but in every case, so far as the observation extended, it was made with great care and conscientiousness.

Each observation was made as follows: At the first visit of the patient the usual record was made of the condition of eyes and appendages, apparent refraction, vision, and whether the latter could be improved by lenses or not, etc.

The eyes were then subjected to the influence of homatropia. For this purpose a fresh 1 per cent. solution was employed, and of this, one drop was instilled into each eye five times in the course of fifty minutes, and the examination commenced in one hour from the time of first instillation. A record was made of the time of each instillation, and of the time of commencing the examination. The second instillation was made about five minutes after the first; the third about fifteen minutes; the fourth twenty-five minutes, and the fifth fifty minutes after the first, the examination being commenced about ten minutes after this last. A record was made of the state of the refraction, and the patient directed to return the next day. In the meantime, a drop of atropia sulph. solution, strength four grains to the fluid ounce, was to be instilled in each eye two times that evening, about three hours apart, and again two times the next morning, with the same interval.

When practicable, the atropia solution was continued for two or three days, with daily notings of condition of refraction, and in some cases, where there were other indications for atropia, this was continued for several weeks.

TABLE OF CASES.

No.	Age.	Sex.	Condition for which Relief is Sought.	Vision.		Apparent Refraction.		Hom. Used.	Refraction Under Homatropia.	
				Rt.	Left.	Right.	Left.		Right.	Left.
1	21	M.	Strabismus	$\frac{20}{70}$	$\frac{20}{20}$	H.M. 2 D.	H.M. 2 D. .	June 4.	H. 2.25.	H. 2.50.
2	12	F.	Eye-strain	$\frac{20}{40}$	$\frac{20}{40}$	M. 1.	M. 1.	June 17.	H. 1.50.	H. 1.75, Ha. 0.50 @ 180.
3	18	M.	Strabismus	$\frac{20}{30} +$	$\frac{20}{200}$	H.M. 1.50 . .	?	June 20.	H. 1.75.	H. 1.50.
4	21	M.	Strabismus	$\frac{20}{200}$	$\frac{20}{20} +$	? . . . .	H.M. 1. . . .	June 28.	?	H. 0.75, Ha. 0.25 @ 180.
5	14	F.	Eye-strain.	$\frac{20}{30}$	$\frac{20}{200}$	H.M. 1	?	July 8.	H. 1.50, Ha. 0.50 @ 180°	Ha. 2 @ 180, Ma. 3 @ 90.
6	21	F.	Eye-strain.	$\frac{20}{30}$	$\frac{20}{30}$	H.M. 0.50 . .	H.M. 0.50 . .	July 11.	Ma. 1 + 90	Ma. 0.75 + 90.
7	30	M.	Eye-strain, period- ical strabismus.	$\frac{20}{200}$	$\frac{20}{70}$	? . . . .	? . . . .	July 19.	Ha. 0.50, @ 180. Ma. 3 @ 90.	Ha. 2 @ 15, Ma. 2 @ 105.
8	13	M.	Strabismus	$\frac{20}{70}$	$\frac{20}{30}$	H.M. 1.50 . .	H.M. 1.50 . .	August 16.	H. 2.50.	H. 4.
9	17	F.	Myopia & eye-st'n	$\frac{1}{30}$	$\frac{1}{20}$	M. 14.	M. 11	August 28.	M. 12.	M. 10.
10	10	M.	Headache.	$\frac{20}{20}$	$\frac{20}{20}$	? . . . .	? . . . .	Sept. 17.	H. 0.75, Ha. 0.37 @ 180.	H. 0.50, Ha. 0.37 @ 180.
11	16	M.	Strabismus	$\frac{20}{30}$	$\frac{20}{30}$	H.M. 1. . . .	H.M. 1.50 . .	Sept. 17.	H. 4.	H. 5.50.
12	26	F.	Eye-strain.	$\frac{20}{30}$	$\frac{20}{70}$	H.M. 1.50 . .	H.M. 1.25 . .	Oct. 17.	H. 5.	H. 4.
13	12	F.	Strabismus	Light	$\frac{20}{40}$	? . . . .	H.M. 1. . . .	Oct. 28.	?	H. 1.50.
14	24	F.	Strabismus	$\frac{20}{50}$	$\frac{20}{20}$	H.M. 1. . . .	H.M. 1. . . .	Nov. 28.	H. 1.	H. 1.
15	11	F.	} Sisters. Strabismus	$\frac{1}{100}$	$\frac{20}{30}$	? . . . .	H.M. 0.75 Ha. 0.37 @ 180	Dec. 2.	H. 4.50.	H. 4.50, Ha. 0.37 @ 180.
16	7	F.		$\frac{20}{70}$	$\frac{20}{50}$	H.M. 2. . . .	H.M. 3. . . .	Dec. 2.	H. 3.	H. 3.50, Ha. 1 @ 180.
17	18	M.	Strabismus	$\frac{20}{40}$	$\frac{20}{30}$	? . . . .	? . . . .	Jan. 2.	H. 0.75, Ha. 0.25 @ 165.	H. 0.75, Ha. 0.25 @ 15
18	27	F.	Headache.	$\frac{20}{30}$	$\frac{20}{30}$	? . . . .	? . . . .	Jan. 22.	H. 1.25.	H. 1.25.
19	25	F.	Headache.	$\frac{20}{20}$	$\frac{30}{30}$	H.M. 0.75 . .	H.M. 0.75 . .	Feb. 5.	H. 0.75.	H. 0.75.
20	20	F.	Headache and eye- strain.	$\frac{20}{200}$	$\frac{20}{40}$	? . . . .	? . . . .	March 3.	H. 3.50.	H. 2.75.
21	10	F.	Strabismus	$\frac{20}{30}$	$\frac{20}{40}$	H.M. 1.25 . .	H.M. 1.25 . .	March 9.	H. 3.	H. 2.75.
22	27	F.	Eye-strain & stra- bismus.	$\frac{20}{70} +$	$\frac{20}{70}$	H.M. 1. . . .	H.M. 1.25 Ha. 0.50.	Jan. 7.	H. 1, Ha. 0.50 @ 180.	H. 1.50, Ha. 0.50 @ 180.
23	23	F.	Eye-st'n and strab.	$\frac{20}{100} +$	$\frac{20}{40}$	H.M. 3. . . .	H.M. 3. . . .	March 19.	H. 6, Ha. ?.	H. 7, Ha. 1.25 @ 145.
24	27	F.	Eye-strain.	$\frac{20}{50}$	$\frac{20}{50}$	M. 0.75 . . .	M. 2.	March 19.	Ha. 0.75 @ 180. Ma. 1.75 @ 90.	Ha. 0.50 @ 180. Ma. 2.25 @ 90.
25	16	M.	Strabismus	Fin'rs 2 feet.	$\frac{20}{30}$	? . . . .	H.M. 1.25 . .	April 18.	?	H. 5.50.

NOTE.—When ? sign is placed, vision was not improved by any glass.

The state of refraction was in each case determined by the glass giving the most distinct vision at twenty feet, with good and uniform illumination, usually controlled by ophthalmoscopic and keroscopic tests.

This method of observation was chosen as being, on the whole, with intelligent patients, less open to objections than any other, the possibility of the physician's bias being likely to invite criticism in ophthalmoscopic and other objective tests.

This report covers twenty-five consecutive cases tested in this way—all that time and opportunity permitted in the time included. The writer is not unmindful that similar experiments have been made and reported, but not in sufficient numbers nor with sufficient exactness and detail to carry conviction to the majority of ophthalmologists.

The effects produced by homatropia in these experiments have been a surprise to the experimenter, as they were not expected.

In the table of cases presented, the following points are noted: 1. Number in the series; 2.

Age; 3. Sex; 4. Condition for which relief is sought; 5. Vision of each eye; 6. Apparent refraction; 7. Date of use of homatropia; 8. Refraction exhibited under homatropia; 9. Remarks, noted at the time of making examination under homatropia; 10. Time of use of atropia; 11. Refraction under atropia; 12. Subsequent use of atropia, and remarks on the case; 13. Final vision.

ANALYSIS.

For purposes of comparison, the cases are divided into four groups:

1. Those in which there was no difference in the effect produced by homatropia and atropia, fourteen cases, or 56 per cent., viz.: Nos. 2, 3, 8, 9, 10, 11, 12, 14, 16, 17, 19, 21, 22 and 24. Of these, circumstances did not permit observations after the use of atropia longer than twenty-four hours in cases 3, 9, 10 and 11.

2. Those in which the use of atropia for twenty-four hours showed a diminution of refraction, without further change by longer continuance of atropia, two cases, or 8 per cent., viz.: No. 4, which developed 0.25 D. additional Ha. and No.

TABLE OF CASES.

Remarks.	Atropia Used.	Refraction under Atropia.		Remarks.	Final Vision.	
		Right.	Left.		Rt.	Left.
	June 5, 6.	H. 2.25.	H. 2.25.	June 10, H. 2.50; June 13, H. 3; June 21, same.	$\frac{20}{40}$	$\frac{20}{20}$
	June 17, 18.	No change.	No change.		$\frac{20}{40}$	$\frac{20}{30}$
not think accommodation relaxed.	June 20, 21.	No change.	No change.	June 30, no change.	$\frac{20}{40}$	$\frac{20}{30}$
		?	H. 0.75, Ha. 0.50 @ 180.	Patient passed from observation.	$\frac{20}{15}$	$\frac{20}{70}$
me as above	June 28, 29.	H. 1.50, Ha. 0.75 @ 180.	Ha. 2 @ 180, Ma. 2.25 @ 90.	July 9, no change.	$\frac{20}{200}$	$\frac{20}{15}$
	July 10, 11.	Ha. 0.50 @ 180. Ma. 1 @ 90.	Ma. 1 @ 90.	July 18, R. H. 1.25 @ 180. L. Ha. 2.50 @ 180, Ma. 1.50 @ 90. July 22 same.	$\frac{20}{20} +$	$\frac{20}{50}$
	July 13, 14.	Ha. 0.75 @ 180. Ma. 3 @ 90.	Ma. Same as homatropia.	July 18, R. Ha. 0.75 @ 180. Ma. 0.50 @ 90. L. Ma. 1 @ 90. July 21, same.	$\frac{20}{20} +$	$\frac{20}{20}$
ot relaxed?	July 19, 20.	No change.	No change.	July 22, R. Ha. 0.75 @ 180, Ma. 3.50 @ 90. L. some as previously noted.	$\frac{20}{50}$	$\frac{20}{30}$
	Aug. 16, 17.	No change.	No change.	Sept. 10, no change.	$\frac{20}{40}$	$\frac{20}{30}$
	Aug. 28, 29.	No change.	No change.		$\frac{20}{50}$	$\frac{20}{40}$
	Sep. 17, 18.	No change.	No change.	Glasses give entire relief from headache.	$\frac{20}{20}$	$\frac{20}{20}$
ould not pres. glasses without atropia.	Sep. 17, 18.	No change.	No change.		$\frac{20}{30}$	$\frac{20}{20}$
ot relaxed?	Oct. 19, 20.	No change.	No change.	No opportunity for later tests	$\frac{20}{30}$	$\frac{20}{20}$
	Oct. 28 to Nov. 1.	?	H. 2.25.	October 28, no change.	?	$\frac{20}{30}$
	Nov. 28, 29.	No change.	No change.	November 11, no change.	$\frac{20}{50}$	$\frac{20}{20}$
	Dec. 2-3.	No change.	H. 5, Ha. 0-37 @ 180.	December 4, no change.	$\frac{20}{50}$	$\frac{20}{20}$
	Dec. 2-3.	No change.	No change.	Jan. 1, habitual strabismus relieved.	$\frac{20}{100}$	$\frac{20}{20}$
	Feb. 23, 24.	No change.	No change.	Jan. 1, no change.	$\frac{20}{50}$	$\frac{20}{50}$
not think relaxation complete.	Jan. 22, 23.	No change.	No change.	March 4, no change.	$\frac{20}{20}$	$\frac{20}{20}$
	Feb. 5, 6.	No change.	No change.	Jan. 29, R. and L., H. 1.50	$\frac{20}{20} +$	$\frac{20}{20} +$
	Mar. 3, 4.	No change.	No change.	February 9, no change.	$\frac{20}{30} +$	$\frac{20}{30} +$
	Mar. 9, 10.	H. 3.50.	H. 3.50.	March 9, no change.	$\frac{20}{30}$	$\frac{20}{30} +$
es better with slip vert., t not imp'd by cylinder. ot relaxed.	Jan. 7, 8. Mar. 19, 20, and 21. Mar. 19, 20.	No change.	No change.	March 30, R. and L., H. 4.	$\frac{20}{25}$	$\frac{20}{25}$
	Apr. 19, 20.	No change.	No change.	January 11, no change.	$\frac{20}{20}$	$\frac{20}{20}$
				March 23, no change.	$\frac{20}{30}$	$\frac{20}{30} +$
				March 23, no change.	$\frac{20}{20}$	$\frac{20}{20} +$
				April 25, H. 6. April 30, same.	?	$\frac{20}{25} +$

in which 4.50 DH. was changed to 5 DH. in the eye.

3. Those in which the use of atropia for twenty-four hours showed no change from the relaxation produced by homatropia, but in which change developed by longer use of atropia, three cases, or 12 per cent., viz.: Nos. 1, 18 and 25.

4. Those in which there was change from homatropia to atropia used twenty-four hours, it in which there was additional change by longer use of atropia, four cases, or 16 per cent., viz.: Nos. 5, 6, 7 and 21.

Cases 13 and 23 do not come under either of these heads. In 13 it was obvious at the examination that homatropia was insufficient. The patient, however, did not return for four days, using atropia all this time, when accommodation was entirely relaxed, making manifest 75 D. additional H. In 23, while astigmatism was evident at the first examination, no cylinder was found that materially improved vision, this being but $\frac{20}{100}$. Atropia was used two days before the patient returned, when 1.25 D. Ha. was found, in addition to the 6 D. previously noted. Atropia being employed immediately after

homatropia in these cases, may have given the former of an advantage.

It would be interesting to study the effect of homatropia after twenty-four hours' use of atropia; the effect of homatropia on several successive days, etc.

This is not a sufficient number from which to draw definite conclusions or generalizations, and none are attempted.

They are given as statements of fact in the hope that others will continue the observations, and that in this way such data will be presented as shall definitely settle the place of homatropia.

MALNUTRITION is the key-note to many disorders of childhood. Not only such obvious forms of malnutrition as the marasmus of diarrhoea, and the wasting of phthisis, should be noted, but also rickets in its frequently overlooked incipient forms, scurvy, and a host of troubles characterized by anæmia, flabbiness, inactivity, chorea, sweating and other neuroses should receive attention. Most of these yield to proper dietetic measures.

FIBRO-SARCOMA OF THE NECK WITH TEMPORARY OPHTHALMOPLÉGIA EXTERNA AND SYMPATHETIC PARALYSIS.

Read before the Section of Ophthalmology of the American Medical Association, at its Meeting in Washington, D. C., May, 1891.

BY H. V. WÜRDEMANN, M.D.,
OF MILWAUKEE, WIS.

J. F., aged 14, a student in the gymnasium of one of the theological schools in Milwaukee, a minister's son, German parentage, referred to me by Dr. D. J. Hayes, consulted me about a protrusion of the eyeball and double vision. The cervical lymphatics of the left side began to enlarge about eight months before and the swelling increased rapidly until at present it is the size of a large orange. There has been no particular pain or illness until a few days before, when Dr. Hayes was called to examine and prescribe for him on account of ill defined symptoms, among them headache and general malaise. The doctor kindly referred the case to me for treatment of the eye. The patient had been seeing double for several days and the eyes were observed to diverge since three days ago.

Upon examination I found a large nodulated tumor of the left cervical region which had pushed the trachea to one side. The left side of the face was flushed and seemed warmer than the right. Complete ptosis existed, the lid falling to lower edge of the pupil, which was contracted and did not respond to light or shade. The eyeball was directed downwards and outwards and away from the median line, making an external squint of about 35° . The conjunctival vessels were flushed. Ophthalmoscopic examination showed the veins more tortuous and fuller than on the papilla of the other side. The tension was slightly lowered, being T. — 1. The accommodation seemed partially affected, the near point being at 75 cm. while that of the other eye was 12 cm. V. R. E. $\frac{6}{8}$; V. L. E. $\frac{6}{12}$. Examination of the refraction showed him about one diopter hyperopic in both eyes. He complained of a dull continuous headache and seemed stupid. Through the kindness of Dr. S. F. French, who took the excellent photograph I present, I am enabled to show the general appearance of the patient upon the day of the first examination.

The eye was bandaged and the patient directed to take hot baths and rest. To my surprise in four days the squint was lessened to about 20° , the eyeball was less prominent and he could raise the lid above the level of the pupil with an effort. The pupil was still contracted and could only be partially enlarged by homatropin. The fundus appeared about the same and the accommodation seemed likewise. The temperature of the affected side was yet warmer to the touch and more flushed than the other. He said that the head-

ache did not trouble him as much, and in the examination he seemed less confused. In one week from the time that I first saw the case the eyes were straight, although double images could still be elicited. I had examined the patient on several occasions, on each of which no trouble of the accommodation could be found. The pupil was still more contracted than that of the other side. V. R. E. $\frac{6}{8}$; V. L. E. $\frac{6}{8}$. Tension normal. The temperature of both sides seemed the same. The tumor appeared larger but softer.

About this date Dr. Hayes injected a portion of the growth with cocaine and removed a little for microscopic examination. Dr. H. V. Ogden made the sections and reported that the sample showed scattered sarcomatous elements with fibrous tissue in preponderance. Several days later the largest nodule of the growth being very soft was opened and removed.



I had hoped to give a photo-micrograph of the section, but I am informed that the specimen has been lost. I saw the patient a month afterwards when he had binocular vision and the eye appeared normal with the exception of slight myosis and ptosis. The pupil responded slowly to light. As an operation on such a large growth, involving such important structures, was not deemed advisable, the boy was sent to his home in the country. His father wrote to Dr. Hayes some six weeks later that the eye remained in about the same condition as last stated. The tumor of the neck was slightly larger and firmer and the sinus was healed. At present writing, nine months from date of first examination, the boy is yet alive. The tumor has broken down in places and discharges through several sinuses.

It seems to me that the eye symptoms were

not incidental, but directly attributable to the pressure of the cervical growth upon the sympathetic nerve. The boy had suffered no exposure previous to the ocular affection and was carefully watched during its course.

There was no co-existing catarrhal disease or any other symptom that might lead one to suspect that the trouble was due to cold. I trace the progress of the disease in the following way: The cervical growth produced an interference of the functions and finally paresis of the sympathetic through pressure upon its trunk. This was the cause of the myosis and of part of the ptosis, the former being due to paralysis of the radiating muscular fibres of the iris, which are under the control of the sympathetic,¹ and the latter to the implication of the M. Palpebralis Superior, or Müller's muscle, which is innervated from the same source.² The reduced tension was likewise due to the sympathetic lesion.³ The one-sided increase of temperature also upholds this view of the subject. All of these symptoms have been described by Horner⁴ as indicative of lesion of the cervical sympathetic, and have occurred in cases where the trouble was clearly due to the pressure of enlarged cervical glands or other tumors upon the nerve trunk in this region.

Section of the sympathetic in the neck or inhibition of its function produces a very great increase in the supply of blood to the side of the head corresponding to the section or lesion.⁵ The increased temperature is due to a local exaggeration of the nutritive processes depending upon the hyperæmia. That the cerebral circulation was affected is evinced by the dull headache and general stupid condition of the patient at the time of examination. Hyperæmia of the brain and its membranes is given by several authorities⁶ as a cause of ocular paralysis. I am reasonably certain that the supposed inhibition of accommodation was due to the stupidity of the patient at the subjective examination, and therefore this factor may be excluded. The muscles of the eyes involved were the external, with the exception as above noted. The implication of these muscles was due to some disturbance in the function of the oculomotorious center under the Sylvian aqueduct, due to the hyperæmia induced by the sympathetic lesion in the neck.

A lesion of the nucleus is an usual cause of external ophthalmoplegia.⁷ As soon as the condition of the blood vessels in this locality became restored to the normal state of affairs its function was renewed and the muscles came under control of the nerve center. The same thing happened to the sympathetic itself, although the paresis

was not so evanescent, as its peripheral effects were observable at the last examination some four weeks from the first time that I saw him, and and were, in all probability, the eye symptoms referred to in the letter mentioned.

805 Grand ave.

ANALYSIS OF THE SENSORY CHANGES AND CONDITIONS OF THE OCULAR APPARATUS AS FOUND IN IMBECILITY, EPILEPSY, AND GENERAL PARALYSIS OF THE INSANE.

Read by title in the Section of Ophthalmology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY CHARLES A. OLIVER, M.D.,

ATTENDING SURGEON TO WILLS' EYE HOSPITAL, ETC., PHILADELPHIA.

The present paper¹ is based upon a series of observations the result of five years' work at the State Hospital for the Insane at Norristown, Pa. The special character of research treated of in this communication, which has been carefully pursued by the aid of competent assistants, is here given as a series of concluding remarks upon those symptoms which have been deemed sufficiently proper for generalization and conclusion. It must be remembered, however, that the work as at present given cannot be considered complete, even from a clinical standpoint, because in reality it consists in a mere placing of all of the more certain sensory changes found in the three conditions (and before published in a separated form), into a single and combined grouping, thus hoping, as was attempted with the motor symptoms, to place them side by side for comparative study. Not that the results can be considered absolutely conclusive; not that there may not be many discrepancies, both from lack of instrumental precision and the difficulty to obtain definite data in each instance, yet still as they show in brief a concise resumé of the practical work which has been going on in the Ophthalmological Department of the Institution for a sufficient length of time to draw probably some useful conclusions, it is here given in the hope that their embodiments, even though tentative, may be of sufficient interest to excite further study in these directions.

As the real subject matter of the paper has reduced to a series of short observations bearing directly upon the different conditions found, taken

¹ Fuchs, "Augenheilkunde," 1889, p. 336.

² *Ib.*, p. 541.

³ Noyes, "Diseases of the Eye," 1890, p. 432.

⁴ Horner, *Krankheiten des Auges im Kindesalter*, 1879.

⁵ Flint, "Textbook of Human Physiology," 1884, p. 738.

⁶ Soelberg Wells, "Diseases of the Eye," 1883, p. 688. *Bull. Niemeyer*, et al.

⁷ Fuchs, p. 606.

¹ This paper, which practically presents an epitome of the sensory peculiarities seen in these clinical groupings, terminates a series of studies which have been written upon by the writer from time to time during the past four years, and which have been more or less confirmed by later investigation. The first article appeared in the *Philadelphia Medical Times* for Feb. 5, 1887; the second was read before the American Ophthalmological Society in July of 1887; the third and fourth were read before the same body two and three years later; whilst the fifth, which contained the final report upon the motor symptoms, was published in the *American Journal of the Medical Sciences* for November of that year.

from the original papers, and as the results have been made into several concise groupings, it will be necessary in such a paper as this to repeat the circumstances under which the studies were made, and to give a brief account of the precautions taken to obtain as near perfect material as possible. To do this, the writer can do no better than to refer to the following abstracts taken from an earlier paper² upon the other branch of the subject:

"1. A special variety of symptomatic disease was taken in preference to any mental condition, because similar mental states in the many and bizarre forms of nerve lesions, making and hiding the true significance of the objective symptoms peculiar to any one disease to such an extent as to render differentiation impossible, are very frequent in mental disorders.

"2. A definite variety of disease was chosen, so as to avoid obtaining a mere percentage of the ophthalmic signs of the total number of cases occurring in one asylum, an answer which through constant changes in the number of the resident population, or temporary peculiarities in the character of mentality, is liable to alter at any time, and thus make such an analysis give results and conclusions which would be totally diverse from those that might be obtained by another observer placed in a different situation.

"3. A large percentage of similar cases was taken. This was done, so that the different mental states which are seen during a definite situation in the course of any one disease might be united in a theoretical example of the physical and physiological conditions of the disease at that stage.

"5. Males were used; this is important, for, by the exclusion of the female subject, any errors that might arise from additional ocular changes dependent upon diseases which are peculiar to the sex, would thus be avoided."

At first, among the epileptics, no differential diagnoses were attempted as to the causation of the convulsions, this being done so as to embrace the entire grouping of such cases into a common lot of subjects, in order to have the greatest variations of supposable differences present at one and the same time, and thus to give greater latitude to error. Later, however, as the subject became more familiar and finer differentiations became more visible, attempts were made to isolate the cases into specialized groupings.

During the examination of the imbeciles, the following precautions were observed:³

"1st. Care was taken to exclude all but the proper class of subjects, no one being admitted who could not be properly designated as one with decided loss of mental power of a minor degree

than idiocy, from malformation or disease of the nervous system, either supervening in infancy or occurring before birth. This was done so as to avoid any error that might arise from the presence of ocular symptoms which might be dependent upon other malformation or disease, and to exclude any question as to the use of the eyes for prolonged near-work during the early years of life.

"2d. Subjects chosen whose eyes were free from extraneous disease or inflammation. Sore eyes of inflammatory and traumatic types were avoided, so as to obtain as nearly as possible representative peripheral (end) organs of comparatively healthy functional activity.

"3d. Young adults were used. This was done for two reasons: first, to have the eye at its full maturity, and thus not to allow any question of further development to enter into the argument; and, second, to have the tissues of the eye at their best before any of the processes of natural decay should have manifestly asserted themselves.

"4th. Males have been taken. These were chosen so as to avoid any errors that might arise from additional ocular changes which might be associated with diseases peculiar to the female sex.

"5th. Every subject was submitted to the same routine examination, thus preventing any seemingly gross changes to appear that might arise from differences in methods of study.

"The reasons for such rules must be obvious, as by their observance all faults in working and want of precision in method are reduced to a minimum, and the conclusions, which are the very import of the work, are thus rendered more valuable and less liable to grave and deceptive error.

"In the third series of cases great care was exercised that each subject was seemingly free from any extraneous general disease or local disorder, and that competent and authoritative medical opinion had been given as to the type of the general complaint; besides, the entire study in this direction has been limited to the male sex, so as to escape any conflicting complicating changes that might appear in connection with the many diseases peculiar to the female sex."

OBSERVATIONS—EPILEPSY.

Subjective.

1. Direct vision for form as a rule normal in both emmetropia and corrected ametropia.

2. Direct vision for color slightly subnormal as shown by faulty selection of delicate tints and shades containing low percentages of green and red.

3. Visual fields for both form and color regularly reduced, without either transposition or reversion.

²American Journal of the Medical Sciences, Nov., 1890.

³See Transactions of the American Ophthalmological Society, 1887.

Objective.

4. Optic disc superficially overcapillary, the deeper layers being decidedly gray, showing a low grade of incipient optic nerve degeneration; this being more marked in the cases where the general convulsive seizures were the most frequent.

5. Scleral ring rather more sharply cut than in the healthy eye, especially to the temporal side of the disc; this being probably due to shrinkage of lowered nerve tissue.

6. Fibre-layer of retina increased in thickness, as shown by coarse and dense massings of striation which extend in all directions from the disc; these being the most pronounced superiorly and inferiorly.

7. Retinal vessels, especially the veins, large in size, and carrying rather dark colored blood.

8. Retinal veins very tortuous, and at times pulsating.

9. Retinal arteries frequently wavy, and sometimes tortuous, particularly the temporal and the macular twigs.

10. Retinal lymph channels generally visible, being recognized as glittering and yellowish-white opacities along the larger vessels and at the vessel entrance on the disc.

11. Granular condition of choroid in the macular region, this being found in the majority of cases.

IMBECILITY.

Subjective.

12. Direct vision for form, as a rule, normal.

13. Direct vision for color probably normal.

Objective.

14. Optic disc apparently more healthy than would be expected for age of patient.

15. Physiological excavation generally seen, usually small, shallow, oval in outline (its long axis bearing no definite relation to the long axis of the disc), and ordinarily occupying a position slightly to the temporal side of the centre of the disc.

16. Scleral ring, as a rule, visible all around disc, it being slightly broader to the outer side.

17. Pigment massings beyond scleral ring ordinarily limited to narrow concentric splotchings and double loops, which are more pronounced to the nasal and temporal border of the disc; the outer massings being generally crescentic.

18. Entire absence of so-called conus. In no instance could a broad crescentic area of bared sclera be distinctly seen; the temporal massings in those eyes which were presumably used the most being roughened and broken on their outer edge, and connected with small and narrow areas of disturbed retina and choroid.

19. Fibre layer of the retina but very slightly increased in thickness; the fine and oftentimes im-

perceptible striation being almost entirely limited to the superior and inferior portions of the nerve border, and extending but a short distance out into the retinal plane.

20. Lymph reflexes and opacities of the vascular sheaths very few, these being mostly confined to the main venous stems at their exit on the disc.

21. Retinal vessels about normal in comparative size, and in a few instances carrying impoverished blood.

22. Choroid devoid of change, except a somewhat granular condition, more pronounced in the macular region; this sometimes being accompanied by a slight absorption of epithelium (especially amongst the most intelligent).

23. Entire absence of any gross congenital malformation.

24. Almost equal degrees of hypermetropia with slight amount of astigmatism present in every case, the average amount of H. being about 2 dioptries.

25. The less imbecile the subject, the more common were the ordinary conditions seen in the used eyes of the mentally healthy.

GENERAL PARALYSIS OF THE INSANE.

Subjective.

26. Direct vision for form reduced in every instance where obtainable; this being in direct ratio, where there was any degree of certainty, to the stage of the disease.

27. Direct vision for color subnormal in the few instances in which it could be properly studied; this showing itself more particularly for green and red.

28. Visual fields more or less reduced in the few cases where any determinate answers could be obtained.

Objective.

29. Optic discs decidedly and unequally semi-atrophic, especially in the later stages of the disease; the degeneration being especially pronounced in the deeper layers and to the temporal side of the nerve head.

30. Capillarity of nerve substance materially lessened, the greatest amount of blood supply being recognized in rather narrow crescentic areas to the nasal side of the disc.

31. The disc, in a few cases seen in the third stage of the disease, of a suffused and gelatinous appearance, its edges being plainly visible, and the surrounding retina being somewhat œdematous.

32. Physiological excavation frequent, it usually being seen to the temporal side of the disc, and extending to the lamina.

33. Scleral ring sharply cut and, as a rule, broad; this being more noticeable to the temporal side of the optic nerve head.

34. Blackish crescents of pigment, broken and

more or less absorbed beyond the scleral ring, frequent at the outer edge of the disc.

35. Pigment lines of different widths and varying degrees of absorption beyond the scleral ring, at the inner edge of the optic nerve head.

36. Fibre layers of the retina, as a rule, diminished in thickness, the greatest amount of striation being seen at the superior and inferior borders of the optic disc.

37. Retinal striation, in a few instances seen during the third stage of the disease, very pronounced, rendering the disc edges quite hazy.

38. Retinal arteries reduced in size, and at times slightly tortuous.

39. Retinal veins, as a rule, undersized, tapering in some instances as they enter the disc, and quite tortuous in a number of cases.

40. Retinal blood currents apparently normal in tint.

41. Retinal lymph reflexes very few; these being generally limited to the walls of the main vascular stems.

42. Fine pin-point opacities in the retina, between the disc and the macula, in a few cases.

43. Choroid granular and disturbed in the majority of cases.

CONCLUSIONS.

1. In idiopathic epilepsy as seen in the male adult, the low grade chronic retinitis and perivascularitis associated with partial red-gray degeneration of the optic nerve, causing decrease of physiological working power, are most probably explained in part by the presumption that every convulsive discharge leaves an additional pathological condition, by which such objective intra-ocular appearances are at last established, as the visible living results of a similar process which has *pari passu* been taking place within the intracranial substance, especially the cerebral cortex, and which may be readily seen post-mortem by careful microscopic examination.

2. In the lower grades of imbecility as seen in the male adult, which have resulted from malformation, or from disease of a minor degree than that producing so called idiocy, that has supervened in infancy or has occurred before birth, the ophthalmoscopic findings of abnormally healthy eye-grounds, presenting pictures that are almost identical with those seen during infantile existence, indicate not only an almost absolute perfection of the visible constituents of the observed tissues, which *per se* should be capable of proper functional activity, but plainly show, by reason of mental incapacity which has supervened in such subjects before the eyes have been brought into continued and constant action as instruments of accurate and delicate use, that the ordinary objective conditions known as: dirty red-gray appearance of the optic disc; irregularity of physiological excavation; non-visibility of the

superior and of the inferior portions of the scleral ring; absorbing conuses in all of their varieties; increase in density and thickness of the retinal fibres; opacities of vascular lymph sheaths; disturbed states of the choroid; and gross errors in astigmatism, with changes in indices of refraction—which are so frequent in the used eye of the mentally healthy—must be considered as pathological changes expressive of low inflammatory action, with stretching and distortion from increased intra-ocular and extra-ocular pressure.

3. In general paralysis of the insane as seen in the male, the ophthalmoscopic appearances of the choroid, optic nerve and retina, are not only indicative of pronounced local disturbance and irritation which represent the results of wear and tear given to a delicate and greatly weakened organ, but are plainly expressive of a degenerate condition of the sensory portion of the ocular apparatus, with impairment of sensory nerve action, manifested as one of the many peripheral evidences of fast approaching degeneration and dissolution of nerve elements, most probably connected with related cortex disintegration and tissue death.

SUBGLOTTIC NEOPLASMS.

Read in the Section of Laryngology and Otology, at the Forty-second Annual Meeting of the American Medical Association, Washington, D. C.

BY JONATHAN WRIGHT, M.D.

OF NEW YORK.

From clinical experience in hospital and private practice in diseases of the nose and throat, including a large number of cases, it seems evident to me that disease of the larynx and trachea of any description is not so frequently met with in New York, as the records of foreign, especially German and French, experience would lead us to believe. Neoplasms of the larynx are certainly not as frequently met with, either benign or malignant, as they are in Europe, or else they are given an undue prominence in foreign literature. While it may be true that benign laryngeal neoplasms exist in the proportion of 1 to $\frac{1}{2}$ percent. of all laryngeal cases in this country, laryngeal affections in general are much less common than abroad. This personal opinion may not be sustained by the experience of other Americans, but there is reason to believe that I am not alone in the observation.

Various localities in the air passages have been mentioned as the most common situation of benign growths, but a careful perusal of literature will, I think, show, notwithstanding considerable discrepancies of statement, that the most common place of development is on the vocal cords or at either commissure. It is conceded that their etiology depends largely upon irritation. Such being the case the places where we should naturally expect to find them would be the most

mobile parts of the larynx and those parts most exposed to the irritation of air, dust and secretions. The subglottic space being the most protected and the most immobile part we should expect less morbid action there. This conforms to clinical observation. Of 1,100 cases, collected by von Bruns, of laryngeal neoplasms, 836 were on the vocal cords. Subglottic tumors are, however, of great rarity, nine only of Fauvel's 300 cases being infra-glottic.

The following history of a case which has lately come under my observation may not be lacking interest and may at least illustrate some important points to remember in connection with subglottic growths.

M. C., a housemaid, æt. 20. Single; born in Hungary, came to the Demilt Dispensary in May 1890. Her family history was good. Three years ago she had been troubled with frontal headaches and pains in the bones which were worse at night. At that time she began to have a coarse cough and some muco-purulent expectoration. Her nose was stopped up and she picked making it sore inside. These symptoms increased. For the last year she had gradually been growing short of breath on exertion, having, however, no difficulty while quiet except at times of severe coughing, of which she had several attacks each day. At times for the last year she had noticed some huskiness of the voice, but as a rule there had been no marked change in it. For the last three weeks she had been feeling weak and unfit for work. Specific history was denied.

Examination:—Pulse and temperature were normal. Respiration 24. She had slight stridor but no dyspnoea.

There was some enlargement of the cervical glands but no other evidence of specific disease. On the left side of the nasal septum in front there was a papillary growth extending over the tip of the nose and to some extent over the anterior end of the inferior turbinated bone. It was covered with inspissated bloody mucus. There was marked thickening of the mucous membrane of the right nostril. The posterior border of the alar lobe had also several wart-like growths, especially where it joins the base of the skull. There were two or three about the size of barley grains on the posterior surface of the soft palate.

Below the vocal cords there was a large constricted looking mass which at first glance seemed to block the whole lumen of the trachea. During the greatest possible abduction of the vocal cords, however, it was seen that the base of the growth was attached to the left side of the cricoid cartilage and the tracheal rings, and projected to the other side beyond, but considerably below the level of the right vocal cord during quiescence. The surface looked uneven, covered with mucus, and as though it were very vascular (this proved

otherwise however). The mucous membrane on the right side of the subglottic space was also seen to be thickened and roughened.

Her imminent danger was explained to the patient, who was somewhat incredulous, but who nevertheless promptly consented to enter the wards of Roosevelt Hospital.

For diagnostic purposes iodide of potash was given in increasing doses. After a few days signs of iodism appeared and the patient had suddenly almost fatal dyspnoea. A tracheotomy was done just below the cricoid cartilage, artificial respiration resorted to and the patient recovered.

Four days later, Dr. Frank Hartley made a long incision dividing the thyroid cartilage and several rings of the trachea, exposing the interior and the growth, which proved to extend downward for about $2\frac{1}{2}$ inches below the vocal cords and to involve $\frac{3}{4}$ of the circumference of the trachea at the point of greatest growth. It had all the macroscopic appearance of an ordinary papilloma. As soon as the trachea was opened the patient ceased breathing and it required energetic artificial respiration and hypodermic stimulation to start the natural respiration again. It was found impossible to resume the ether, although several attempts were made causing cessation of the breathing. Of course etherization was commenced through the tracheotomy tube and later given through a tube inserted at the lower angle of the tracheal wound. The operation was therefore finished under partial anaesthesia. The growth was found to be flattened by the pressure of the tracheotomy tube. It was cut away from its attachment, which included the under surface of the left vocal cord, by knife and scissors, the base and every vestige of suspicious looking mucous membrane, including the small growths on the right side, were thoroughly and deeply cauterized with the Paquelin cautery.

A tracheotomy tube was left at the lower angle of the wound, and the upper part of the trachea and the larynx was packed with iodoform gauze. The latter was removed in a few days and some weeks later the tube was withdrawn and the wound closed without any untoward symptoms, but she remained totally aphonic.

She was discharged from the hospital and again became an out-patient under my care. The growths were removed from her nose by cautery, snare, and forceps.

At the anterior laryngeal commissure was a pale, flabby growth about the size of a split pea. It was apparently a granulation nodule at the site of the thyrotomy incision. Failing with the forceps, this was destroyed by the galvano-cautery.

The patient was kept under occasional observation for six or seven months. Her voice did not return, but at the end of that time small sessile growths began to appear just beneath the

right vocal cord. A small portion of these was removed with the laryngeal forceps. Since then the patient has disappeared from view. There was no deterioration of the general health, although the patient naturally became somewhat hypochondriacal. The left vocal cord in the process of cicatrization was almost completely destroyed, at least as far as its usefulness in phonation was concerned.

Gerhardt has lately stated that the differential diagnostic point between syphilis of the trachea and tracheal cancer is that cough and signs of irritation do not occur in cancer as initial symptoms, dyspnoea being the first sign of trouble. In this case, which, however, was a benign tumor, it will be noted that a harsh cough preceded the dyspnoea by two years.

In fact, it is remarkable how little dyspnoea the patient suffered when her trachea was all but occluded by the growth. It was only on exertion, or from some temporary increase of mucus or transient congestion from coughing, that she experienced much discomfort. Such cases show how much larger than necessary for quiet respiration the trachea is, the extra size being Nature's supplementary device for emergencies—a device which makes violent and extraordinary exertion possible, and which renders simple inflammatory inflammations all but harmless.

It illustrates a point too often forgotten in obstruction of the air passages, viz., that the dyspnoea is most frequently due not so much to the mechanical stenosis as to the spasmodic or paralytic condition of the vocal cords, which irritation of the mucous membrane or compression or irritation of the nerve trunks may cause.

Intrinsic *laryngeal* tumors and extrinsic tumors pressing on the air passages, close alongside of which run the nerve filaments, may cause severe attacks of spasmodic dyspnoea, whatever the size or extent of the disease may be, while intratracheal disease rarely gives any dyspnoetic symptoms until the mechanical stenosis is very great.

Koch,¹ in his late article, said:

"If a tracheal tumor produces dyspnoea, that tumor is necessarily of large size, and of such a nature as to suffocate the patient at any moment. The laryngoscope gives us a defective idea of the size of the tumor on account of the inevitable shortening of the vertical diameter, while the intensity of the dyspnoea furnishes us with a more exact guide."

How suddenly, and with what little premonitory warning, an almost entire occlusion of the remaining air chink may take place, and the patient pass from comparative comfort into a condition rapidly terminating in suffocation is shown in this case, and in others of a similar nature. In dyspnoea caused by spasmodic contraction of

the vocal cords—the dyspnoea of many cases of thoracic aneurism, of hysteria, of inflammation, of *laryngeal* neoplasms—there is usually a certain leeway allowed for the performance of tracheotomy, because, as soon as insensibility from the carbonic acid poisoning occurs, the spasmodic action of the glottis is usually suspended, though this is not inevitably the case. The sufferer may then gradually return to consciousness, or at least get enough air to keep his heart going for a time. Purely mechanical obstruction, however, is a different matter.

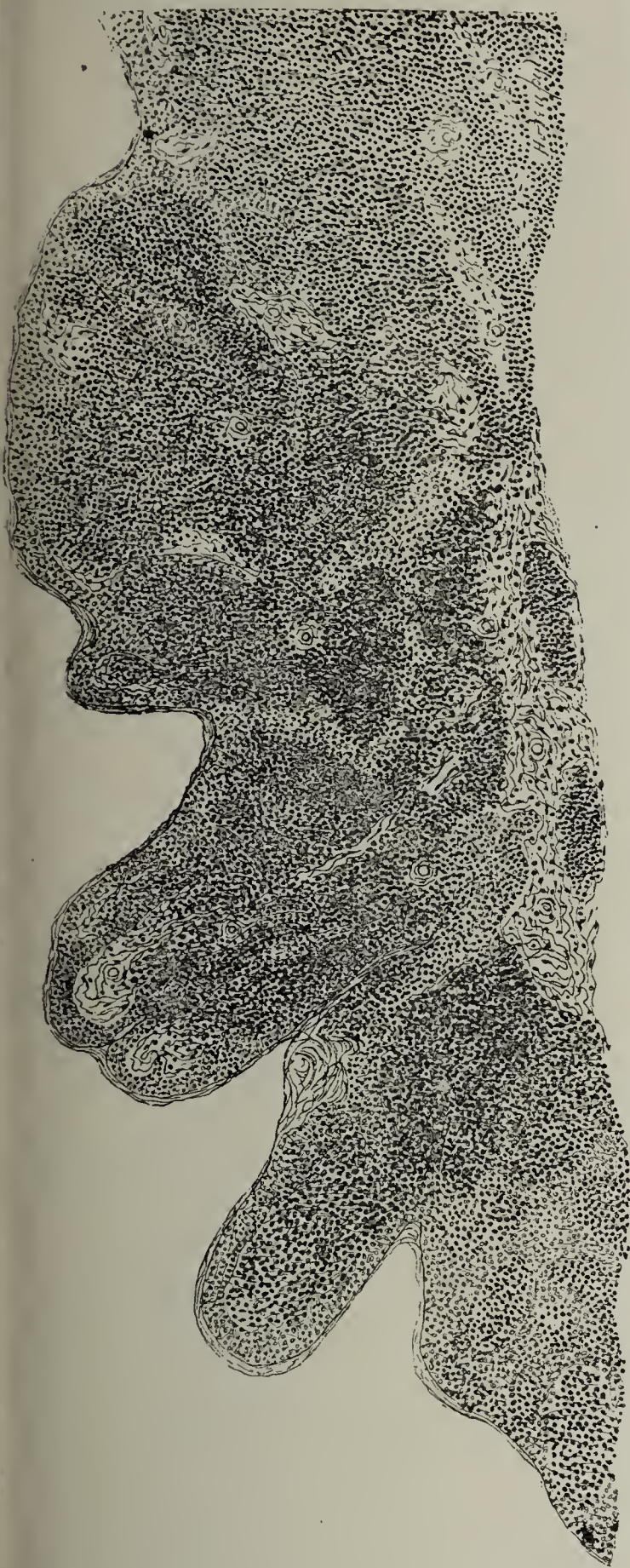
Therefore, when the iodides are given for obstructive disease of the air-passages which may not be syphilitic, and even in cases where the diagnosis of specific disease is certain, especially when the obstruction is subglottic, it is well to remember that *slight* congestion is a very common sequel of even moderate doses, and that even slight congestion may prove disastrous if immediate surgical aid is not at hand.

More than half of all the cases of benign laryngeal neoplasms reported have been recorded as papillomata. It is very suggestive of insufficient pathological discrimination that there should be such a preponderance of this growth. As to the character of the growth in the case reported, you will see from a drawing of a microscopic section made by Dr. Hodenpyl that it consists essentially of a mass of lymphoid tissue covered by pavement epithelium, which dips down into its substance as digitations, and rises above the surface as papillae. These papillae, as well as the substance of the growth, have for a framework the masses of lymphoid cells. There was more than the usual amount of fibrous tissue found in the ordinary so-called adenoid growths, though in the section from which this drawing is made it is not apparent.

If we regard this as a true tumor, the proper designation, according to the rules laid down by Virchow, would be "Lymphoma papillare." If, however, we are to accept the definition of a tumor, "that it is a non-inflammatory growth of new formation of tissue fulfilling no physiological purpose," this, as well as all so-called adenoid vegetations, should be designated as a papillary lymphoid hypertrophy. This is a question for histologists who are accustomed to arrange such matters to suit themselves, irrespective of clinical convenience and experience.

Lymphoma of the larynx, according to all authorities who mention it, is of the greatest rarity as are many of the other benign forms of tumors although they are common enough on other mucous membranes. This is probably due to the fact that in the larynx, as is the case in the bladder, morbid growths, either benign or malignant, are usually attended with the increase and hypertrophy, as well as the new formation of papillae, on their surfaces.

¹ Koch: Ann. des mal de l'oreille, etc. Oct., 1890.



Notwithstanding the protest of Virchow, and of many of the best histologists, these growths, when benign, are all classed under the head of "papillomata," whatever may be the predominant histological element in their structure.

This leads to great clinical confusion, and to a mistaken conception of the nature and pathogenesis of these growths.

The only records of so-called lymphoma of the larynx which I have met with are two cases, one referred to by Gottstein in his book, and another reported in the *Lancet* for October 15, 1887, by Beale; both of these accompanied general lymphomatosis. Wolfenden and Martin however, in their brochure, "Studies in Pathological Anatomy," give a drawing of lymphoid hypertrophy, which they call lymphoma, and which occurred in the larynx independent of any general affection.

Notwithstanding this apparent rarity, I do not believe it can be so uncommon, but that some of these papillary tumors, if carefully examined, would be found to consist largely of lymphoid tissue. Sarcoma is also extremely rare in the trachea.

Such mistakes in nomenclature have been largely avoided in malignant tumors, owing to the importance of the prognostic aspects in such cases; but malignant tumors of the mucous membranes are quite as likely to be supplied with fungous or papillary surfaces as are benign growths, if not more so.

As observed above, it is rare that small tracheal growths come under observation, except where they coexist in the larynx. The question of treatment is in these cases frequently a puzzling one, and always an important consideration.

Those rare forms of tracheal gummata occasionally seen are of course to be treated by large doses of iodide of potash, and it may always be advisable, with proper precautions, to give the iodides where the diagnosis is not perfectly plain.

Leaving malignant tumors out of the question, and confining ourselves to the class of cases of which the one reported is a type, there are three methods of extirpation where interference is advisable :

1. Intubation with long O'Dwyer tubes.
2. Intra-laryngeal operations; by
 - a. Forceps or snare.
 - b. Cautery, either galvanic or chemical.
3. Extra-laryngeal operation.

The procedure by means of intubation is yet in its infancy, and is, of course, applicable only to those subglottic cases where the disease lies close beneath the vocal cords. Rapid absorption of benign and even syphilitic growths have been reported by Simpson and others. Intubation can probably be advantageously employed in connection with the intra-laryngeal use of the forceps

or of the cautery. With this I have had no personal experience, but it is certainly deserving of a trial, the dangers and difficulties which attend other methods being absent or reduced to a minimum by intubation, and in event of failure, the toleration acquired from the intermittent use of a tube would be of the greatest advantage in intra-laryngeal operations.

The greatest difference of opinion prevails as to the proper cases for intra- and extra-laryngeal operations, some going so far as to urge an external operation even in supra-glottic tumors in adults, while others go to the other extreme by urging that even in children infra-glottic growths may be removed *per vias naturales*, cases having been reported where papillomata were removed from the fifth tracheal ring. The sanction of Fraenkel, of Berlin, to intra-laryngeal operations in cancer will not now be received with favor by the majority of laryngologists.

In tracheal growths, in the vast majority of cases, the tumor will usually be of such a size when first seen that nothing but an external operation would be advisable. In small, benign growths, in a tolerant adult, attempts by the intra laryngeal method will often be met by the most brilliant immediate results even in the trachea, but recurrence will be frequent, because it is impossible to be sure that the growth is completely eradicated.

Where attempts are to be made in larger tracheal growths, through the natural passages, thorough preparation both of patient and attendants should be also made for an immediate external operation, because, in event of failure to remove the growth, enough congestion and inflammatory action may be set up to lead to complete tracheal occlusion.

The choice of instruments will depend largely on the personal bias and skill of the operator and the character of the growth. Personally, for small sessile growths, I prefer the white hot guarded galvano-cautery electrode. For growths which project more onto the lumen of the trachea, McKenzie's lateral or longitudinal forceps are preferable, with, however, more of a gradual curve at the angle than is seen in the usual patterns.

Cauterization by chromic acid, although recommended by some of the most experienced operators, seems to me of inferior value, except to cauterize the base of a tumor removed by the forceps. When the epithelium is intact, these growths certainly are not as quickly destroyed by acids as by the actual cautery. (Of course, I speak principally from experience in other situations than the trachea.)

A very practical point in these intra-laryngeal operations is the way in which the patient reacts to the application of cocaine. In many patients it leaves nothing in the way of local anæsthesia

to be desired. In others it seems impossible to produce satisfactory results with any safe dosage, this applying to the 20 per cent. strength as well as to weaker solutions. Cases are not rare where severe constitutional symptoms of the drug may appear before any practical local action is observed. It is at once the most useful and the most uncertain of drugs.

In considering the question of an external operation, the operator should be well satisfied of the impracticability of the operation by the natural passages. In many cases a preliminary attempt may be made by intra-laryngeal methods, and in event of failure, the external operation immediately done.

The dangers of the external operation are not only that to life, but also to the integrity of the voice. It is unnecessary to dilate upon the dangers of fatal pneumonia or bronchitis following the operation. This case illustrates a danger which is not satisfactorily explained, namely, the occasional prompt cessation of respiration or of the heart's action the moment the trachea is opened. I have had two cases of tracheotomy where the heart was paralyzed at the moment of opening the trachea, although the pulse had been a moment before fairly good. There seems good grounds for the belief that there exist areas below the glottis, the excitation of which may profoundly affect the functions of the heart and lungs. It is possible that these areas may also exist outside of the trachea in the anterior cervical region. At any rate, there are enough cases on record to demonstrate that this operation has dangers beyond those usually ascribed to it.

In tracheal tumors there is the added danger of hæmorrhage from an incision of the tumor itself in opening the trachea. When a vascular tumor is attached to the anterior wall, this may cause very great embarrassment to the operator, and a fatal termination may ensue.

The danger to the integrity of the voice is of course not to be weighed in the balance with the patient's life, and should be entirely a secondary consideration. It is probable that the early writers have exaggerated this danger even in laryngeal growths. The simple separation one from another of the wings of the thyroid cartilage, bearing with them the attachments of the vocal cords, is probably a minor factor in the production of future aphonia or dysphonia. The danger comes from damage to the vocal cords themselves, and this may occur in endo-laryngeal operations as well. In the eradication of tracheal growths by an external operation, the division of the thyroid cartilage will usually be found necessary to gain room, and should not be omitted for fear of damage to the vocal apparatus.

A preliminary low tracheotomy is not a necessity, nor always of advantage, in spite of what

Koch says at the end of his article, although in some cases it may facilitate matters. It would be encroaching on the domain of general surgery to go further into the question of the technique of an external operation for these tracheal growths, suffice it to say that the indication is usually perfectly plain, and should be promptly met, as every moment of delay is fraught with danger to the patient.

In sections made from the fragments removed from the recurrence on the right side of the subglottic space, the microscopic appearance had more the resemblance of a small, round-celled sarcoma.

The difficulty in distinguishing lymphoid growths of the mucous membrane from small-celled sarcoma by microscopic examination is often very great. In the last year I have been puzzled in several cases, and submitted the sections to several experienced microscopists. In every instance I met with a diversity of opinion as to the character of the growth.

I have a number of such sections in my possession, and the similarity between the simple lymphoid growths and those which afterward proved to be malignant is striking.

In one case, I followed by repeated microscopic examinations of fragments removed at different times the course of a small, round-celled sarcoma to the nose. The first specimen was universally regarded as of a benign lymphoid character. It gradually changed in appearance to that of un doubted sarcoma, of the small, round-celled variety. The clinical history and situation made the diagnosis of sarcoma probable, even at first.

EXCISION OF THE MEMBRANA TYMPANI, THE MALLEUS AND INCUS, AS A MEANS OF TREATMENT IN OTITIS MEDIA CATARRHALIS CHRONICA, AND IN OTITIS MEDIA PURULENTA CHRONICA.

Read in the Section of Laryngology and Otology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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What which is offered in this paper is somewhat the nature of a report on the progress of aural surgery in a very important direction. Although a new operation, the operation of excision of the membrana tympani and the two larger ossicles, as performed in this country, in thorough organization and elaboration, is new, and entirely due to the labors of Dr. Samuel Sexton, of New York. Excepting Dr. Sexton, Dr. Colles of New York, and myself in Philadelphia, are

the only ones in this country who have performed the operation and published accounts of its performance.

The indications for the operation are:

1. The deafness, tinnitus and vertigo of otitis media catarrhalis chronica, especially when adhesions exist between the membrana tympani and the promontory, or there is evidence of synechiæ between the ossicles.

2. The suppuration, deafness, tinnitus, vertigo, headache and recurring earache of otitis media purulenta chronica.

The *rationale* of the operation, in chronic catarrh of the middle ear, is the improvement of the hearing by obtaining a permanent perforation in the membrana tympani, and, by a removal of the malleus and incus, to unload the stapes, and thus relieve the tinnitus and vertigo so often found in this disease, usually misnamed Ménière's disease, and incorrectly referred to nervous disorder in the labyrinth. In otitis media purulenta chronica, by exsection of necrotic tissue, drainage is improved, and more direct medication being applicable, the suppuration in the tympanum is checked. Cessation of the suppuration, reduction of the swelling of the mucous membrane about the fenestræ, and the removal of such mechanical obstructions, relieve deafness and tinnitus, and the stapes being thus unloaded, vertigo is checked. The operation, as performed by myself, has always been upon the etherized subject, the ear being illuminated by a 6 volt electric head-lamp, of two or three candle power, run by a 6-volt portable battery. The lamp is an Edison incandescent lamp, the illuminator or lantern holding it being made by the River and Rail Electric Light Company of New York, while the battery I now use is a 6-volt storage battery, weighing 11 lbs. 6 ozs., made for me by the Electro-Dynamic Company of Philadelphia. By this means a pure white light is obtained.

Anæsthesia is necessary, as the patient must be absolutely still. The use of ether, which I prefer, necessitates the employment of an electric lamp, to avoid the risk of setting the patient on fire, as an artificial light must be brought very near to insure sufficient illumination of the ear. Reflected sunlight would answer the same purpose, if it could always be had when and where desired. The electric head-lamp gives direct illumination, which allows a freedom in the movements of the surgeon's head, greater than reflected light would permit.

The operation in otitis media catarrhalis chronica is necessarily different from the operation in otitis media purulenta chronica, as in the former the membrana tympani and ossicula are intact, while in the latter, parts of the auditory conductors have been destroyed by disease. The operation in chronic catarrh of the middle ear, as performed in this country, consists in making,

first, an initial incision behind the short process of the malleus, continuing it by means of a probe pointed knife up to the membrana flaccida and then backwards, throughout the periphery of the posterior superior quadrant of the membrana, so as to expose the incus-stapes joint. I do not cut into the bone tissue to do this. If the incus-stapes joint, which lies very high in the attic in some subjects, cannot be exposed by exsection of soft tissues, I proceed without touching it at this stage of the operation. When the incus-stapes joint is exposed, I pass between the malleus and incus a small two edged knife, triangular in shape, 2 mm. long, set at right angles on a slender shaft, and rotate the instrument between thumb and forefinger and sever the incus-stapes joint. The surgeon's eye can easily follow all of this manoeuvre. Now the incision in the membrana tympani may be carried a little lower, both on the periphery and manubrium, if the perforation is not already large enough to permit the withdrawal of the incus.

2. While the incus is held in position by its attachment to the malleus in front and by its short process behind, the long process may be seized with forceps, and the entire bonelet easily withdrawn. If this is not done at this stage of the operation, subsequent manipulations will almost surely displace the incus from view and it cannot be easily found. All grappling after the incus, when it cannot be seen, is inadvisable, as the incus will rarely be caught after being lost from view, and irritation of the entire tympanic cavity will surely follow rough probing in the attic after the misplaced incus.

3. With a curved two edged tenotome, now sever the tendon of the tensor tympani muscle, by cutting upward behind the short process of the malleus.

4. With a probe-pointed knife sweep about the entire periphery, seize the malleus at or above the short process, never below it, and withdraw the malleus and the membrana tympani attached to it.

5. The hæmorrhage is so slight in otitis media catarrhalis chronica, that gentle mopping with baked cotton is sufficient. I refrain from mopping with any fluid in these cases. The meatus should now be lightly stopped with baked cotton or iodoform cotton, and let alone for twenty-four hours.

My operations in all cases, both in chronic catarrh of the middle ear, and in chronic purulent otitis media, have been performed only after all other rational means have been tried and failed to give relief.

In otitis media catarrhalis chronica the operation has been undertaken to relieve deafness, tinnitus and vertigo, as all of these symptoms are often present in the same subject. Sometimes deafness occurs alone; but tinnitus is never found

in chronic catarrh of the middle ear without some deafness, and vertigo is never present in this disease without tinnitus and deafness. When deafness is present alone, even when the operation does not remove it, I have never known it to make the hearing worse, nor to be followed by tinnitus or vertigo. Regeneration of the membrane often follows, preceded by painless suppuration, or more commonly by an excessive discharge of clear, glairy mucus. Some numbness of the tongue, from section of the chorda tympani, may be felt in two or three days and continue for a short time after the operation, but it soon wears off.

In many cases of chronic catarrh of the middle ear, nothing else but this operation will benefit. So-called mobilization of the stapes, stretching the chain of bonelets, and section of the folds of the membrana, amount to nothing. The first two are probably never really done, as the stapes cannot be reached under inspection, in most cases.

Traction on the malleus simply, will not affect the stapes, and the lightest traction on the incus will detach it from the stapes. Traction on the stapes, if the latter can be seen and seized, will quickly break the crura. Section of the folds of the membrane, like simple incision in the sclerotic membrane, may improve the hearing for a few minutes or even hours, until the incision heals. No permanently good results can be shown to have followed these expedients, like those resulting from excision of the membrana tympani and the two larger ossicles.

Relief from a sensation of pressure in the ear is one of the most constant results of the operation. In some instances, signal relief from aggravated tinnitus and aural vertigo follows immediately upon the operation, and is permanent. The least frequent result in otitis media catarrhalis chronica, is permanent improvement in hearing. Section of the chorda tympani nerve is of no consequence, as the numbness of the tongue produced by it disappears in a few days.

Organization of the Operation, in Chronic Catarrh of the Middle Ear.—The patient must be in fair health, and should live moderately for some days preceding the operation. The operation should not be performed during menstruation. After the operation the ear should be lightly stopped with baked cotton or 5 per cent iodoform cotton; but not with bichloride cotton, as it may irritate the skin of the canal when kept in constant contact. Patients should remain in bed twenty-four hours after the operation, and in the house not more than five days. Then it is best to go out, at first with ear stopped with cotton, in all seasons of the year. It is advisable to avoid sudden motions of the head and anything tending to sudden congestion of the head.

¹ See case reported by C. H. Burnett, American Jour. Med. Sciences, February, 1890.

If suppuration or a mucous discharge sets in, cotton must not be worn in the ear, as it gets moist and macerates, and irritates the meatus. Regeneration of the membrana tympani interferes with none of the gains of the operation, excepting improved hearing; this is diminished, as a rule, by regeneration of the membrana, but not always, according to Lucae and others.

Conclusions, in Chronic Catarrhal Otitis Media.

1. The operation of excision is attended with no bad results, even if it do no good.

2. The most constant result of the operation is a relief from a sensation of pressure and fullness in the ear.

3. The next most frequent result of the operation is the prompt, entire and permanent relief of tinnitus and aural vertigo (Ménière's symptoms).

4. The least frequent result is improvement in hearing. Sometimes, however, this is marked. If the hearing is improved by the operation, but diminishes upon regeneration of the membrana tympani, the latter can be broken down as often as it re-forms, until its reparative power is overcome. In some cases it appears that the improved hearing persists, notwithstanding regeneration of the membrana tympani.

5. In those cases of chronic catarrh of the middle ear, in which everything else has been tried without benefit, it would seem that the patient should have the chances of improvement offered by this harmless operation.

The Operation in Otitis Media Purulenta Chronica.

1.—In some cases of chronic suppuration of the middle ear the operation has a wider field of application, and the results are better. Suppuration, after defying all other means, is checked by

Thus the sequelæ of chronic purulent otitis media are warded off. It is especially useful in attic suppuration, with the sole perforation in the membrana flaccida. In such cases there is always necrosis of one or more ossicle, and sometimes of the surrounding osseous wall. By the operation necrotic ossicula can be removed, drainage of the attic secured, and direct medication rendered practicable. If the surrounding osseous wall of the attic is necrotic, it can now be reached conveniently after excision of the membrana flaccida and the two larger ossicula.

In suppuration of the atrium with the sole perforation in the membrana tensa (below the folds), it will be found, if the perforation is small and situated below or in front of the manubrium, that the disease is limited to the anterior portion of the atrium, that granulations and granulation tissue are flourishing on the inner surface of the membrana and in the front part of the tympanic cavity. In such cases, when the disease has been lying on defiantly for years, it will yield quickly after the diseased tympanic wall and the granulations are treated—best, according to my ex-

perience, with chromic acid, which could not have been applied before the excision of the membrana.

The deafness is often astonishingly improved by the operation, rising from *nil* in some cases to 15 feet for isolated words of ordinary tones.² Tinnitus too is quelled, and vertigo and headache banished. The general health is markedly improved, after the removal of necrotic tissue from the ear. In many of these cases the patients have been suffering from a mild form of chronic septicæmia. In children the repeated gatherings in the ear are entirely overcome by the operation.

Since, in otitis media purulenta chronica, we have to deal with necrotic remnants of the conductors of sound, the operation varies greatly from that in otitis media catarrhalis chronica. It varies, in fact, in every case of otitis media purulenta chronica, according to the ravages of the chronic disease. Hæmorrhage is always more abundant and confusing in chronic purulent otitis media than in operations of chronic catarrh of the middle ear.

In otitis media purulenta chronica the first endeavor should be to expose the incus-stapes joint, if not already exposed, by a pathological perforation in the membrana tympani. If the incus is not diseased in any way, and still in connection with the stapes, it may remain, but if diseased in any point, either by granulations or caries, it must be removed. A view of this bone is more easily obtained in attic disease with a large perforation in the membrana flaccida, or when this perforation is enlarged by the knife. If the operation is applied in a case of attic suppuration, with the sole perforation in the membrana flaccida, the perforation should be enlarged so that the attic can be inspected, and examined with a probe for diseased bone. Caries of the malleus will invariably be found, and generally, too, the incus is carious or destroyed by necrosis. All carious tissues should of course be removed. In attic cases, the malleus may first be removed, as the incus cannot escape from view if present in the attic, with the large perforation in the membrana flaccida. If present, the incus should next be removed, and the surrounding walls examined for caries. If caries be found on the inner tympanic wall, very little, if any, scraping should be done there, because, now that thorough medication can be applied directly to the attic, carious bone tissue will tend to crumble off and the bare surface to cover in with muco-periosteal membrane, if the caries is not extensive enough to have caused the formation of a distinct sequestrum.

If the latter has formed, it should be promptly removed. Often it will discharge itself after the attic has been opened and drainage improved.

² See case reported by me, Philadelphia Med. News, August 16, 1890.

In purely attic cases the lower tympanum will often be found entirely free from disease. In very chronic attic disease, after destruction of the incus and the head and neck of the malleus, the manubrium and membrana tensa remaining intact, the atrium is converted into a pocket, which will be found filled with pus and cholesteatomatous masses, beneath which granulations will be found on the promontory and upon the inner surface of the membrana tympani, as in a case recently operated on by me, but not yet published.

If the case is one of chronic suppuration of the middle ear with the perforation in the membrana tensa, *i. e.*, anywhere below the folds of the membrana, the membrana flaccida being intact, excision should be performed in the same way as in a case of chronic catarrh of the middle ear, unless the perforation in the membrana is so large as to permit thorough inspection of the atrium and its examination with a probe. If the perforation is small and the discharge very chronic, granulations will be found on the inner surface of the membrana tympani and upon the inner wall of the tympanum.

The latter region is often of a uniform, velvety surface of granulation tissue, passing into true discrete granulations near the tympanic mouth of the Eustachian tube. The lower end of the manubrium may be found carious, if included in the periphery of the perforation.

Such conditions in the tympanic cavity, revealed only by excision of the membrana, when the perforation in it is small, demonstrate the uselessness of the routine treatment usually pursued in such cases. These are the cases which, beginning with a muco-purulent discharge from the ear, in a child, proceed defiantly and uninterruptedly, no matter what the treatment, for years, until with impaired and decreasing hearing the membrana tympani is gradually sloughed away, the ossicles more or less destroyed by necrosis, and the drum cavity, both in the attic and atrium, choked with granulations and cholesteatomatous debris. Then the aditus and the atrium mastoideum, and the mastoid cells are invaded. Before the latter event, however, cerebral abscess may be developed, or sinus thrombosis and pyæmia may bring about a fatal termination. The least that happens in such cases is an impairment of hearing, and a chronic offensive discharge from the ear or ears.

Given, therefore, a case of chronic otitis media purulenta, with a small perforation of the membrana tympani and impaired hearing, which has continued for a year or more, and undergone all forms of ordinarily employed routine treatment, we all know the logical sequence of its natural history to be what I have just described.

We also know that the imperative demand upon the aurist is to arrest such a process as quickly as possible, not so much to save hearing

as to save health, and probably the life of the patient. Old methods will not do it in numerous cases, notably among those with poor hygienic surroundings. Defiant cases are common even among the wealthy, who are surrounded with every means of health. In excision of the membrana tympani and necrotic ossicles is offered an efficient and prompt means of stopping the purulency and preventing the ravages which will surely follow a continuance of the suppuration. The hearing and health of the patient will surely be improved, and his life rendered safer, because of the removal of the risk of sinus thrombosis, pyæmia and cerebral abscess.

There would be very little, if any, mastoid disease, if purulent otitis media in children were promptly cured. In many instances there is no way to check it but to perform excision of the membrana, and thus get at the disease while still limited to the anterior portion of the drum cavity and before it has even made a large perforation in the drum-head. At once drainage is improved and direct medication of the diseased mucous membrane can be carried out. Then solutions, powders and caustics can be applied rationally and with good effect.

The hearing will improve, the suppuration will be checked before reaching the attic or the mastoid, and a new membrana tympani will form, the mucous membrane of the drum cavity assuming a dry, white and shining appearance.

Conclusions in Cases of Otitis Media Purulenta Chronica.—1. The operation has not failed to stop suppuration in all the cases of chronic purulent otitis media in which the writer has applied it.

2. In attic cases with normal atrium, the perforation being in the membrana flaccida, the operation is the only means of cure.

3. By this operation, in cases of chronic purulent otitis media, in which the sole perforation is in the membrana tensa and is comparatively small, and while the purulency is limited to the anterior part of the drum cavity, the suppuration is promptly checked, before it has had an opportunity to attack the posterior portion of the drum cavity. Thus mastoid inflammation and necrosis, sinus thrombosis, pyæmia and cerebral abscess are prevented.

4. If any hearing exists before the operation it invariably improves after the excision.

5. Vertigo, headache, tinnitus, and the ordinary attacks of ear-ache from "gatherings," common in chronic otorrhœa in children, are entirely and permanently relieved by the excision of the necrotic remnants of the membrana tympani and the two larger ossicles.

A BRIEF ACCOUNT OF THE ETIOLOGY AND TREATMENT OF TINNITUS AURIUM.

Read in the Section of Laryngology and Otology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 6, 1891.

BY LAURENCE TURNBULL, M.D., PH.G.,
OF PHILADELPHIA, PA.

It is not the object of this brief paper to dwell at length on all forms of tinnitus aurium, but to omit those which are so well understood and treated by every well educated medical man; as, for instance, those caused by cerumen, pressing on the membrana tympani; inflammation or swelling; exostosis or abscess of the auditory canal; that large class caused by catarrhal changes in the tympanum or middle ear, and the Eustachian tubes; changes of structure with deposit in, or on, the membrana tympani with or without perforation and polypus in or near the same region. It will be our desire to dwell on the more obscure forms which we find in disease of the internal ear, labyrinth, auditory nerve, and above all, the reflex causes of deafness, with the most distressing forms of tinnitus.

It is now well known by you that there exists a connection between the auditory nuclei in the medulla, the pons, and the cortical auditory centers of either side of the brain, and that the "sense of hearing is in greater part situated in the temporal lobe, and more especially in the superior temporal gyrus of this lobe."

As Dr. Ferrier has stated in a letter, tinnitus may occur in both ears, as the result of unilateral irritation, the effect of the intimate connection of the auditory nerves and centres. The cases of sensory cortical discharges reported by Hughes Bennett may be advanced, Dr. Ferrier thinks, to establish this view. Ferrier writes that Baginsky states that the auditory nerve is in relation with the auditory centre of the cortex, through the lower fillet of the opposite side, and thence by means of the posterior tubercle of the corpora quadrigemina, and internal geniculate body to the medullary fibres of the cortex.

We may thus classify, according to Professor Jones, the principal sources of reflex irritation or inhibition of the auditory nerve: *a*, Through communications at the nuclei of origin; more especially might this occur through the sensory fifth and tenth nerves. *b*, Through the communications with the facial in the internal auditory meatus, the reflection from this connection being transmitted along the petrosal nerves from the otic and Meckel's ganglions, and the parts supplied by them. *c*, Through communications between the nerves supplying the tympanic structures, and Meckel's ganglion and the otic and geniculate ganglions. According to Foster, the activity of the tensor tympani muscle is regulated by reflex action. *d*, Irritations may be re-

flected to the cerebellum or the auditory centre and referred to the ear or different parts of the head. Most important are the researches of Gaskell as to the presence and course of vaso-constrictor and vaso dilator fibres (which control the blood supply by constriction or dilatation of the small vessels) arising, the former from the upper part, and the latter throughout the whole length of the spinal cord, and which pass to the cervical ganglions of the sympathetic, and thence (in this instance) to the special arteries, furnishing the supply of blood to the ear, more especially the internal auditory, from the basilar. Also, of importance is the fact that certain nerves, such as the trigeminus and cervical sympathetic, appear to be supplied with special "pressor" fibres (McKendrick), which have the power of constricting the vessels; this may occur either from a direct or reflected irritation of these fibres, which irritation, as in the case of the cervical sympathetic nerve, must have an important effect on the circulation in the ear. Of the various other nerve communications and distributions in the ear, which bear on reflex irritation, we would remind you of the connection between the glossopharyngeal, fifth, and sympathetic nerves, as, for example, the supply of the tensor-tympani and stapedius from the otic ganglion and the facial nerves respectively; the communications in the tympanic mucous membrane, between Jacobson's nerve, the sympathetic, and the geniculate ganglion of the facial nerve, and the other communications between the carotid plexus of the sympathetic, Jacobson's nerve, and the otic and Meckel's ganglions, thus bringing all these nerve communications into direct relation with the superior cervical ganglion. The supply of the anterior wall of the external auditory meatus and the tympanic membrane from the auriculo-temporal is an important point bearing on reflex irritation from affections of the external meatus, which cause tinnitus, when the middle ear is healthy. This sensory supply, be it remembered, is connected with the facial and pneumogastric nerves.

The abnormal physiological conditions which are likely to cause tinnitus.—With regard to the physiology of hearing, it does not appear that there are any proofs that separate centres exist for the perception of different kinds of sound. A sensation arising from any irritation in the auditory centre may be referred to the periphery, that is, to the origin of the nerve filaments in the labyrinth (McKendrick). The receptive auditory centre is possibly in part situated in the cerebellum. An irritation occurring either in the labyrinth, the auditory nerve, or receptive centre, will, Professor McKendrick considers (in a communication which he has kindly written to Dr. Jones on this subject), "produce a stimulus in the hearing centre which will cause a sensation or a

series of sensations which will always be referred to the labyrinth. Such irritations may be caused by anything that interferes with the normal equilibration of the fluid in the labyrinth, by any direct or reflected irritation of the nerves of the external meatus, the middle ear, or labyrinth." They may follow or attend the presence of abnormal constituents in the blood which circulates in the respective centres, as well as alterations in the blood supply due to increase or diminution of blood pressure. This latter condition occurring either at the periphery, in the cerebellum, or in the course of the auditory nerve would be in itself sufficient to start an irritation of the hearing centre.

It has to be remembered, as Professor McKendrick rightly insists, how exquisitely sensitive the auditory nerve apparatus is, a fact with which all are acquainted who have studied the physiology of the ear in its perceptive powers, and its faculty of differentiating, analyzing, and synthetically arranging sound waves.

Vertigo.—Certain disturbances in the equilibration of the labyrinthine fluid, or reflex irritations of any part of the nervous apparatus of the labyrinth, or irritation of the auditory nerve nuclei, may cause the symptom of vertigo to accompany that of tinnitus. Stimulation of the cerebellum or cortical auditory centres may have the same effect; such stimulations may be reflected; deafness is not necessarily an accompaniment of the vertigo under these conditions, nor is it absolutely necessary that there must be local aural changes discernible in those suffering from the symptoms portrayed by Ménière.

Tinnitus Aurium Produced by Aneurismal Dilatation of the Left Posterior Auricular Artery.—We have had several cases of this form of tinnitus. In these there was a peculiar whistling and puffing sound (aneurismal thrill), caused by aneurism of the temporal branch of the internal carotid artery. In one case reported, the artery was tied with success. According to Hyrtl, there is in man a capillary which passes to the promontory. Might not affections of the tympanum frequently induce alterations in this vessel? Patients are sometimes relieved of pulsatile sounds by compression of the external carotid. The application of the continuous electric current is beneficial, particularly in passive congestion from vascular atony; it excites contractility, and causes the blood stasis to disappear.

The various forms of pulsating tinnitus are the result of aneurism or some alteration in the blood-vessels, anæmia, or excessive action of the heart; we must try compression of the temporal or carotid, diminishing the frequency of the heart's action by aconite or digitalis, or if the patient is anæmic, administer the salts of manganese, or lactate or citrate of iron, or the combination of iron and common salt. (Flint, New York.)

Very good results have followed their use in anæmic deafness with tinnitus.

We must make careful diagnosis, by exclusion, to discover whether we have excitement of the brain causing subjective noises, or on the other hand exhaustion from over effort or some drain upon the nervous system. In the first instance, we resort to bromide of potassium or sodium, or if there is any suspicion of syphilitic complication, add bichloride of mercury and the iodide of potassium, with the active principle of jaborandi to produce greater activity of the salivary and sweat-glands.

If it be from exhaustion, we resort to a solution of phosphoric acid employed in the form of "lemonade," or to the phosphites or hypophosphites, in conjunction with strychnia or its salts, and the use of the galvanic current to assist in completing the cure.

A case relieved by operation. Pulsating noises, with vertigo. Miss Maria C., the sister of a distinguished western physician, was sent to us with a letter, in which he stated that his sister had a persistent discharge from the right ear, in which she was almost absolutely deaf. She was a teacher of music, and had to be much exposed, out of doors, during all kinds of weather. She was very intelligent and cultivated, and was a skilled musician, but was most distressed about the discharge, and the odor, which was obvious in spite of great care. She was also much annoyed by the peculiar pulsating noises in that ear, and the dizziness was also so severe at times that she was afraid of falling, and had to grasp at any object for support. She had been treated by various means, but without success. Having been very successful in treating a nephew, she placed herself under our care, being quite ready to carry out all directions faithfully. After cleansing the ear, we found the membrana tympani perforated, the opening being in the upper inferior quadrant, but entirely closed with polypoid granulations which extended from the perforation all the way forward, involving the upper wall of the bony meatus. After removing the posterior mass by several operations, by the wire snare, pressure was made by a probe, and it entered a cloaca-like opening in connection with diseased bone, and this at once caused her a severe attack of vertigo, which lasted, even when the instrument was removed, several seconds.

By the administration of large doses of quinine and hydrobromic acid, and now and then an anodyne on account of pain in the part, she was able to allow the gradual removal of all the diseased bone by scraping with a small sharp, spoonlike instrument. We then applied the actual cautery, and, lastly, a ball of fused nitrate of silver on an aluminum wire. After many months of treatment it filled up with healthy granulations, and closed. The discharge gradu-

ally diminished, and the perforations healed by the use of boracic acid and solution of boro-glyceride. Several relapses occurred. She has been residing in the country, giving music lessons and doing Sunday-school work, and being out in all weather, but has had no severe relapse. Another method is proposed, first, by Lucca, and still another is the removal of the membrana tympani, malleus and incus; a method which is still *sub-judice*.

Spastic Contraction of the Intrinsic Muscles of the Eustachian Tube. *Diagnosis.*—Spastic contraction of the tensor tympani causing the noise in separating the mucus in the Eustachian tubes.

Treatment.—Inhalations of chloroform, and belladonna by the middle ear; to allay spasms, and valerianate of quinine and oleo-resin of cubebæ to act upon the nervous system and mucous membrane and the Eustachian tube. With the primary galvanic current in front of the ear and in the Eustachian tube by our intratympanic catheter, and this, together with the local application of a sol. argenti nitratis to the tonsils, diminished the sounds. The continued use of the battery, with the local application to the throat and mouth of the Eustachian tubes of the fluid extract of hydrastis canadensis by means of our Eustachian forceps generally afford relief. These cases may be arranged under two classes—one in which the spasm is involuntary, and not controlled by the will of the patient, and the other voluntary.

The Influence of Aural Diseases upon Nervous and Mental Disorders.—The neurologists and psychologists do not estimate the importance of this subject, or give it due attention in their examinations. Dr. Catlett reports the case of a man about fifty years of age, an enterprising, moral, sober-minded person, a successful merchant, who had enjoyed uninterrupted good health previous to the accession of the persistent and "peace-destroying" tinnitus, which caused him to abandon his business and give up family and friends; but in all his wanderings over the world he was still pursued by his tormentors, and finally shot himself the night after he had consulted with the doctor, who was unable to report whether the hallucinations had any association with aural disease, as the doctor was unable to examine the condition of the ears. In cases of insanity, which if not caused by, is increased and maintained by aural disease, this should be treated.

Our rule should be that if there is any hereditary tendency to mental disease, and the hallucinations are persistent, resembling any of the forms of which we have given examples, care should be taken that the ears be examined, and if it be possible, the symptom of tinnitus removed.

Always endeavor to encourage the patient by suggesting that an improvement may occur by

varying the treatment, and also by being able to state that the brain or auditory nerve is seldom involved, and that as a rule it depends in the great majority of instances on some slight change in the muscles, ligaments, or blood vessels of the middle ear, which may cause increased pressure in the labyrinth. Hundreds of such cases are relieved by simply removing the offending cause.

In the peculiar class, complaining of "Chirping of Sparrows" and "Musical Sounds." (Reflex Tinnitus.)—We place them on a mixture of

sherry wine and tincture of nux vomica, five drops in a tablespoonful after meals, feeling sure the sounds depended upon some reflex irritation of the spine reflected to the semi-circular canals. The success of the treatment confirmed the diagnosis. The use of this drug entirely relieved the annoying symptoms after one month's treatment.

There are also certain occupations that increase the intensity of the noises, as in those engaged as telegraph operators, locomotive engineers, boiler-makers, and machine or mill-workers.

Mental Influences.—There are certain mental influences which increase or diminish these sounds. As occasioned by a happy frame of mind, the pleasant dry weather, such will often diminish the intensity. Worry or ill temper, meeting strangers, or wet, damp, cold weather, or intense heat, or a close room, will often increase these sounds. Pleasant occupation or active work, or riding in a carriage or railroad, will diminish them. Tinnitus is usually not so intense during the day time, but becomes much louder when everything is quiet, or at night. This is especially the case if the individual suffers from dyspepsia or indigestion. The subjective noises are produced or increased by sickness of the stomach, or during pregnancy and the puerperal state, and before menstruation.

There are various forms of reflected "reflex-tinnitus." Painful noises are produced in the ear from diseased condition of the kidneys, more especially diabetes, also in Bright's disease, which latter causes effusion of blood and serum in the middle ear, with a peculiar form of tinnitus, which can be removed by proper constitutional treatment.

Tinnitus caused by disease of the labyrinth is usually of a low pitch, and there is a "rushing" and a "humming," caused by increased pressure in the labyrinth forcing the stapes inward. The following are the usual means or agents employed in the treatment of labyrinthine tinnitus.

Treatment.—Pilocarpin, nitroglycerin, hydrobromic acid, ergot, mercury, iodide of ammonium and potassium and strychnine; these with the cholagogue preparations and some other measures have been found by us to be the most effective remedies if employed in the early stages. (See the author's "Manual of Diseases of the

Ear, p. 497, 2nd ed.) We report one case as showing the effects of a combined treatment:

Case I.—John H.—Nov. 24, 1890.—In his 49th year; had distressing tinnitus aurium for one year; has been a chewer of tobacco and a smoker for the last ten years; becomes now and then intoxicated; enlarged liver; heart sounds indistinct; slight opacity with sinking of membrana tympani; countenance dull and face congested; circulation sluggish; taking bromide of potassium and chloral.

R. Ung. potass. iodide comp. to apply over liver.

R. Tinct. digitalis with spiritus ammonia arom. āā gtt. xx thrice daily in water for heart as a stimulant, and

R. Cerateum pilocarpin muriat. around ears.

R. Cerateum hydrarg. ox. flav. et morphia, used in the meatus on cotton.

Nov. 25.—No improvement; confined to house; messenger stated that the family were afraid of his becoming insane; did not sleep; filled up the ear with a 10 per cent. warm solution cocaine hydrochl.; opened Eustachian tube under ether vapor; made application of comp. sol. of iodine in glycerine to posterior nasal space; applied strong sol. of menthol in front of ear; also directed six ounces of blood to be drawn by leeches or cups from front of ear and mastoid process; ordered Sprudel salts; to repeat the anodyne solution of potassii bromidium with chloral at 9 P.M. and 12 M.; his head feels hollow; no dizziness, but "hissing sound" most of the time, which may be from diseased blood vessels; pulse normal, tongue white, bowels irregular; not to use tea or coffee, and continue to use laxative.

Nov. 26.—Leeches have bled well; slept but little; employed the anodyne mixture freely; states that "if he cannot get better he will go mad;" his general appearance is better; used hypodermic of $\frac{1}{4}$ gr. sulphate morphia and $\frac{1}{50}$ gr. nitroglycerin back of ear and occipital region; when under the influence of anodyne perforated the membrana tympani at lower quadrant and scarified the auditory meatus.

Nov. 27.—Did not sleep during the day, but at night he was able to sleep under the influence of a half grain of codeia; pulse 88; respiration normal; no pain; blood still discharged from the ear; opened the Eustachian tubes under ether, and administered hypodermic of $\frac{1}{50}$ gr. nitroglycerin.

Nov. 28.—Patient about the same; did not sleep with the use of the codeia; introduced $\frac{1}{50}$ gr. nitroglycerin and to take through the day every three hours $\frac{1}{100}$ gr. with mixture of bromide of potassium and chloral and a dessert spoonful of "bromo-caffeine." He states that he is "so anxious to get well" he is willing to take anything; pulse more steady and regular; have now made up my mind that the trouble is "alcoholism," with hallucinations which induce insanity if not relieved.

Nov. 29.—Patient came in advance of his attendant and stated that he was a great deal better, had but very little pain and that the noises were very much less, had taken a tablespoonful of the mixture of the bromide and chloral with two teaspoonfuls of the "bromo-caffeine" and had slept naturally all night; had taken his Carlsbad salts, which had operated also; had his hepatic region well rubbed with codine ointment, taking the increased dose, thirty drops in water, of Squibb's hydrobromic acid; a hypodermic of $\frac{1}{50}$ gr. nitroglycerin and $\frac{1}{8}$ gr. muriate of pilocarpin aristol was used in meatus.

Nov. 30.—Had a fair day and was able to sleep all night; had a slight increase of tinnitus after the last dose of hydrobromic acid.

Dec. 1.—Hypodermic of nitroglycerin $\frac{1}{50}$ gr., cleansing the ear with soda solution; still improving, and able to sleep, but took his $\frac{1}{100}$ gr. nitroglycerin every three hours.

Dec. 4.—Returned after absence of two days, still doing well; noises not so great; slept well; not to return but on alternate days, and requires no attendant; introduced hypodermic of $\frac{1}{150}$ gr. of nitroglycerin and gave him 100 pills, one to be taken three times a day; continue the other therapeutic agents.

Dec. 6.—Patient continues to improve, and was able to sleep all night; noises much less; bowels moved naturally, and able to take care of himself.

Dec. 8.—Patient feeling very much better; slept well, and had a good day; continued treatment; perforation open; secretion discharge ceased; scabs and dried blood removed later from meatus.

Dec. 10.—Still improving; cleansed ear; opened Eustachian tube under ether; examined liver, found the enlargement gone and much relieved.

Dec. 13.—Improvement continues; finds the inflation by Valsalva's method increases noises; Eustachian tube open, and throat and nose almost clear.

Dec. 16.—States to-day that he is "first rate;" noises not distressing him; cleaned the opening in the membrana tympana and made application to the throat.

Dec. 20.—Feels very well; scarcely any noise to-day; ear feels well; perforation open; throat doing well.

Dec. 24.—Is doing well, able to sleep, eat, and feels well.

Dec. 27.—Sleeps without anodynes; noises still slight, but not like the harsh sounds which he stated "seemed to raise even the bed blankets." Swelling over liver gone so that he can sleep on that side.

Dec. 31.—Feels quite well to-day, and has been since last visit; opened Eustachian tube with catheter and ether and directed to continue treatment until Jan. 24th, when he was discharged, feeling well enough to do without the doctor.

NATIONAL ASSOCIATION OF MILITARY SURGEONS OF THE NATIONAL GUARD OF THE UNITED STATES.

CONCERNING THE ORGANIZATION OF THE MEDICAL DEPARTMENT OF THE NATIONAL GUARD.

Read at the First Meeting of National Guard Surgeons, at Chicago, Sept. 18, 1891.

BY J. D. BRIANT, M.D.,

SURGEON-GENERAL OF THE NEW YORK STATE NATIONAL GUARD.

While the title of this paper is sufficiently expressive, as it seems to me, to make its importance obvious to all concerned, still, it is not the intention of the writer now to do more than to speak of the medical officers of the Guard and their immediate aids. The scope of a complete organization for the duties of active service, as in the case of the regular army, is too extended to be considered at large at this time, and in fact it may be best considered by a careful study of the methods employed in the regular army itself. I shall deem it sufficient at present to dwell upon the necessity of what may be called self-evident requirements of the medical service, requirements, the advisability of which are so obvious as to hardly need more than the mention to carry conviction to all minds. Those of you who are at the head of a well-organized medical department can appreciate its importance to the service, as well as the assiduity necessary for its establishment. Those who are anticipating such a desideratum can but welcome the opportunity here offered to profit alike by the facts to be presented and the friendly criticism they will necessarily inspire. I shall speak of the Guard as an entirety, giving to it the comprehensive significance of the expression National itself. This course is proper, since the prime object of the organization is similar in all States—the protection of individual and public rights from organized and otherwise ungovernable violence. And, too, in each State, the Guard is sustained by the patriotism and local pride of the citizens of communities, who as willingly perform military duty in the Guard as they pay taxes for its support. It follows from these indubitable facts that the people of these communities, and of States even, expect, as they have the right to, a wise preparation for an efficient protection from violence of private and public interests, whenever the occasion demands it. And it is equally logical to say that their approbation and support of the Guard will be directly proportionate to the actual and prospective benefits which they contemplate or receive by reason of its existence. It, therefore, follows that the medical, like every other department of the Guard, should be so organized as to give to the greatest number the greatest good at all times that is consistent with military

efficiency. The necessity for such provisions in the medical department of many States is pregnant with the sentiment that teaches that :

The woes of the defenders
Of a country's cause
Should be soothed by a wise adjustment
Of a country's laws.

This sentiment refers not alone to the sense of grateful patriotism that contemplates a liberal and substantial recognition on the part of a country of those who have served in her defense, but also it implies a practical adjustment of matters by wise measures in times of peace, for the prevention and alleviation of physical disaster in times of strife. In the amplification of this idea I cannot help but believe that the medical department of the National Guard should be so constituted that it may extend "prompt aid" to the citizen-soldier and citizen-taxpayer at all times in case of physical emergencies. The consummation of this plan can but meet the hearty approval of those it is intended to aid, and will thus cause, on their part at least, a proportionate increase in the moral and financial support of the Guard. It has been my great honor, as well as pleasure, to have been connected officially with the Guard of New York since June, 1873. About ten years of this time were devoted to regimental service, a service that enabled me to study the needs of the medical department at large, and especially to note the deficiencies of the one under my immediate charge. During the remainder and later portion of the service—about nine years—I have, as surgeon-general of the State, been able, with the concurrence of the commander-in-chief, and the advice and individual support of the officers of the medical staff, to advance the status of efficiency of the medical department to a considerably higher plane than it formerly occupied. At the time of my entrance to the Guard, no properly authorized medical scrutiny of the professional qualifications of an applicant for the position of medical officer in the Guard had been established, except that he shall have graduated from a medical college; and this requirement was assumed to have been complied with quite as often as it was demonstrated to have been by the exhibition of fitting credentials. And, too, at this time it was necessary that the commandant of the organization be convinced that the applicant was a "good fellow," and would "fill the bill," at least in all respects essential to good-fellowship. Good policy and good principle often parted company at this phase of requirement. At all events, the essential qualifications that constitute a proper medical officer, in the professional sense, could be made subservient to the social, financial and political considerations of the laity sense. As the result of this policy, while many good and true men were recruited, yet many—indeed, too

many, in fact—were accepted who valued the commission only for the selfish gain they hoped for, rather than the honorable and useful record it might have in store for them. It is plain to be seen that a policy of this kind furnished not only indifferent medical service of the legally authorized type, but also opened the way for even a great abuse—the acceptance of those who were possessed of no legal qualifications whatever to practice medicine or surgery. Please do not misunderstand me; for while this abuse was of rare occurrence indeed, still the system was such that it need not have been the exception, in so far as official medical scrutiny exercised any control. It is not strange if, at this time, commanding officers often looked on their medical subordinates in the light of physical ornaments and conveniences, or as animated luxuries, to whom they might refer matters of a medical tenor for decision, when they felt condescendingly inclined, or when good policy dictated that their own opinion should have the genuine or implied approval of a medical officer. I will not dwell longer on the unfortunate realities nor the grave possibilities of this former course of action than to add that it was not the result of indifference or dishonesty, but simply a phase in the developmental history of the Guard. Please remember that this period is twenty years to the rear of the one of to-day, and although a continuous improvement was made in this respect by the cleansing influence of a ferment of earnest and wise purposes, and the survival of the fittest, still it was not till the issuance of an order, of which the following extracts are the greater portions, that the matter was placed on an official and enduring basis :

GENERAL HEADQUARTERS, STATE OF NEW YORK. }
 ADJUTANT GENERAL'S OFFICE. }
 ALBANY, August 28, 1888.
 General Orders No. 17.

1. Upon the recommendation of the surgeon-general, persons appointed to medical offices will hereafter be examined, before being commissioned, by special boards selected by the surgeon-general, and hereby appointed :

Returns of appointments of medical officers will be referred by the commanding officers of brigades to the boards appointed for their respective commands, and all concerned will be governed by the rules prescribed in General Orders No. 14, series 1887, from this office, so far as the same are applicable.

2. Appointees to medical offices shall be further examined in the standard branches taught in legally incorporated medical schools; the diagnosis and treatment of injuries and diseases to which troops may be exposed; the means employed for the urgent relief, and for the transportation of sick and wounded, including stretcher drill (see provisional manual of instruction, U. S. A.); camp and personal hygiene; and as to their knowledge of official papers relating to their department.

By order of the commander-in-chief.

JOSIAH PORTER,
 Major-general and Adjutant-general.

Now please note the results of the enforcement of this order : The worth of a medical commis-

sion in the National Guard is greatly enhanced, and medical men of high attainments now seek positions in the service, serve faithfully, and wait patiently for promotion; the commanding officers respect their value and ability, and, therefore, seek their advice and heed it. The efficient, faithful and conscientious medical officers are now leavening the entire loaf of the medical service, and have become examples for emulation, instead of subjects of pomp or objects of pity, as they were often in the past.

The educational influences of the State Camp, which was established in 1882, and the introduction of rifle practice throughout the Guard, made the presence of the surgeon, and the importance of his attainments, thoroughly appreciated. Prior to 1887, the hospital stewards were of the most nondescript character. I recall well the fact that the first hospital steward coming under my charge in the regiment with which I was connected in 1873 was a stable-keeper. He was both faithful and honest, and his assiduity and endurance were phenomenal. His attention to duty was exceeded only by his entire ignorance of the preparation of medicines and their physical properties. For some time prior to 1887, I had advised that only such as were legally qualified to dispense medicines by the laws of the State relating to pharmacists should be permitted to act as hospital stewards of military organizations. However, my advice in this respect was not heeded until the occurrence of an object lesson which was so emphatic and pointed as to permit of no delay in the issuance, August, 1888, of an order, of which the following is an extract.

"The hospital steward of the regiment in camp, or, if there be none, a suitable person selected by the surgeon-general, will act as post-hospital steward under the orders of the post-surgeon and the instructions of the surgeon-general. Such person or hospital steward must have passed an examination before the State Board of Pharmacy, and be licensed as a druggist according to the laws of the State; and regimental and battalion hospital stewards not so examined and licensed will not be recognized by the State, or permitted to act as hospital stewards. Regimental and battalion commanders ordered to camp duty whose hospital stewards do not meet those requirements will at once report the fact to these headquarters."

It may not be amiss now, in view of the importance of this order, to narrate the event that inspired its immediate promulgation, especially since this course may serve as a warning, and again aid in the establishment of a reform, the necessity for which at one time came near causing a most distressing accident, if not a fearful calamity in connection with the State Camp of New York. A lady, the wife of an officer of the general staff, visited the State Camp one evening

to witness the dress parade, and while there was attacked with a severe neuralgic headache, for the relief of which she wished me to prescribe. This I did, going myself to the camp druggist for the remedy, instead of sending an orderly with the prescription, as is the custom. The prescription called for a half grain of codeia and ten grains of bromide of potassium to be taken at once.

While waiting for the compounding of the remedy by the acting hospital steward of the organization then in camp, I leisurely leant against the center pole of the drug-store tent and made a casual survey of the contiguous tents and company streets. A moment after, and almost unconsciously, my attention was directed to the manipulations of this officer compounding the order, and I noticed that he had measured a considerable quantity of a whitish powder, which had not the appearance of bromide of potassium, and was too large an amount, I thought, for the required codeia. I asked, "What is that?" "Codeia," he said. "How much?" I inquired. He replied "One half a grain, as you ordered." "It cannot be possible that one half a grain of codeia will make so much bulk," I exclaimed. "Please balance your scales." He did as directed, weighed the powder again and found that there were six and a quarter grains of codeia instead of one half a grain as ordered. You will better appreciate my feelings and excuse this detail of statement, I think, when I tell you that the lady was the wife of the Surgeon-General himself, and that she would have been some distance from camp, no doubt, before the full effects of the drug could have appeared. This lesson is made still more impressive by the fact that the acting hospital steward at that time was an educated physician of some years' experience. And, too, it teaches in no uncertain manner that one unfamiliar with the physical properties of drugs should not be permitted to assume the duties of hospital steward.

Thus the uneducated hospital stewards were disposed of, so far as the service of the State camp was concerned. About one year later the final fatal blow was dealt to the system by the issuance of the following:

"It appearing that there are hospital stewards who are not qualified, according to the laws of the State, to perform the duties required of them, commanding officers are directed to discharge such from the service at once. Hospital stewards should have passed an examination before the State or county boards of pharmacy, and have secured licenses as pharmacists."

There remains but one other feature of the medical service to which I shall call your attention now—the education of a certain number of the rank and file in the simple methods of rendering "prompt aid to the injured." At the present

time, in the Guard of the State of New York, the plan of procedure is indicated with sufficient clearness by the following order, which paved the way to its enforcement:

GENERAL HEADQUARTERS, STATE OF NEW YORK. }
ADJUTANT-GENERAL'S OFFICE. }

ALBANY, December 22, 1887.

General Orders, No. 36.

1. Commanding officers of regiments and battalions, and of batteries and separate companies having a medical officer, will organize ambulance corps in their respective commands as follows:

For a regiment or battalion, the corps shall consist of the medical officers of the command, the hospital steward, and three enlisted men from each company of seventy-five men, and two enlisted men from each company of less than that number.

For a battery or separate company, the corps shall consist of the medical officer and four enlisted men.

The enlisted men shall be detailed by the commanding officers, upon the recommendation of their senior medical officers, and there may be included in the detail for a regiment or battalion two corporals, and for a battery or separate company one corporal, but no other non-commissioned officers.

When the exigencies of the occasion require, commanding officers will detail such enlisted men as have already been found proficient, and may also detail musicians for duty with the corps.

Men detailed for ambulance service shall be relieved from such duty on the application of the medical officer having charge of the corps to which they are attached.

2. The corps shall be under the immediate orders, control and instruction of the senior medical officer of the command to which it belongs, but no assignment or detail for duty with the corps shall relieve an officer or enlisted man from his regular duties, except when on duty with the corps in active service.

3. To prepare the members of the corps for their duties, the medical officer in charge will provide a course of instruction. This course shall commence in the first week in January of each year, and continue during the drill seasons of the year, and shall be open also to such other members of the command of which the corps is a part, as may be approved by its senior medical officer.

The dates, hours and places when and where the instruction will be given, shall be published in orders to the whole command by its commanding officer.

4. The course of instruction given by the medical officers of the command shall include, for the present:

Rudimentary instruction in anatomy and physiology.

Rudimentary instruction in the diagnosis of the common accidents and diseased conditions to which National Guardsmen are exposed, and the common means for the prevention of the same.

Instruction as to the common means employed for the urgent relief of the sick and the injured, including stretcher drill and matters pertaining to transportation of the sick and injured.

Instruction in individual and camp hygiene.

5. At the close of the course of instruction, the detailed men of the corps shall be examined as to their proficiency, by a board to be appointed for that purpose, as hereinafter provided.

The senior medical officer of each regiment, battalion, battery and separate company, shall keep a record of the name, proficiency and general standing of each member of the ambulance corps under his charge, from the time of the first attendance of the member to the termination of his course of instruction, and also the result of his examination.

6. Commanding officers of brigades will, with the approval of the Surgeon-General, appoint for their respective commands boards of examination, which shall consist of not less than three medical officers, whose

duty it shall be to examine and report to the brigade commander as to the proficiency of the detailed men who have attended the prescribed course of instruction. These men will be ordered before the examining board on the application of the commanding officers of the regiment, battalion, battery or separate company to which they belong.

7. Enlisted men of ambulance corps, when actually on duty as such, are authorized to wear, in addition to insignia of military grade, around the left arm above the elbow, an arm badge (brassard) "of white cloth, 16 inches long and 3 wide, with a cross of red cloth 2 inches high and 2 inches wide in the centre."

8. An enlisted man who has passed the prescribed examination satisfactorily, and has the approval of the commanding officer of the brigade to which he belongs, will be permitted to wear at all times a badge, of a pattern to be prescribed in further orders, distinctive of the ambulance corps of this State, as an indication of a special fitness to aid the sick and injured under urgent circumstances.

9. Details for instruction in the duties of an ambulance corps will be made annually, at such time as will permit the course of instruction of each succeeding class to begin promptly in the first week in January.

10. There shall be allowed and issued by the Chief of Ordnance, as Acting Quartermaster-General, State Arsenal, corner Thirty-fifth St. and Seventh Ave., New York City, upon requisition made direct to him by the respective commanding officers, stretchers of a pattern approved by the Surgeon-General, at the rate of two for each regiment and battalion, and one for each battery or separate company having a medical officer.

By order of the Commander in Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

You will observe that the expression "ambulance corps" is employed in this order, and you will quickest comprehend the contemplated scope of the proposition embodied in the order, I think, if its aims be distinctly isolated at once.

1. The annual education of a definite number of men, many of whom would be declared competent by a board of examiners to render prompt aid to the injured comrade in times of strife, and to the comrade or citizen in the event of physical misfortune in times of peace. These to constitute the ambulance corps of the season.

2. The keeping of a yearly record of the proficiency of each of these men, with the view of the selection of those who are most serviceable when a serious occasion demands. This corps to be the ambulance corps of the occasion.

Already numerous instances have been brought to the attention of the State military authorities of the aid and comfort rendered by these men to the afflicted citizen in case of physical misfortune. And on all occasions in the service of the guard they have given wise advice and commendable injunctions to their comrades, and have promptly and efficiently spanned the important interval between the immediate demands for their own efforts and the arrival of a medical officer. It is proper to add in this connection that there is often much opposition on the part of commandants to making the details required by the order, so much in fact that the organization of a permanent corps instead is being given

a serious consideration. It might appear unjust on my part were I not impelled to add that this opposition is not a general one by any means, but one that is limited more especially to the smallest of the company and regimental organizations. However, in all of those commands in which unity of purpose, *esprit de corps* and personal pride of organization are the predominating features, the opportunity to acquire the knowledge is hailed with delight and eagerly accepted. I will now venture the statement that the interest and appreciation exhibited by military commands in measures best intended to increase and extend their importance and usefulness, and the earnestness of their coöperation in them, is in direct proportion to their prosperity, and to the confidence and esteem in which they are held by both the military and civil authorities. The badge mentioned in section 8 of the order is made of coin silver, and bears the red cross and the legend, "Prompt Aid to the Injured" on the face. Thus far it has been permitted to become the property of the winner, and is worn by him on all occasions, civil and military, as evidence of his ability to give prompt aid to the injured of all classes. It is now my opinion that the badge should be the property of the organization, in order that it may not be retained by those who are out of active military service, and for this reason may depreciate its value by its unwarranted use, and by failing to keep pace with the requirements of the service. At all events, some evidence should be retained by the worthy members at all times which will justify the belief that they are competent to perform their duties in this service, and will offer to them the opportunity and right of receiving instruction when sought for, and bear evidence of continued assiduity and competence on their part.

[NEW ORDER.]

GENERAL HEADQUARTERS, STATE OF NEW YORK, }
ADJUTANT-GENERAL'S OFFICE, }
ALBANY, September 3, 1891.
General Orders No. 23.

1. General Orders No. 36, from these headquarters, dated Dec. 22, 1887, providing for the organization of ambulance corps, and for the instruction of men detailed for ambulance service, is hereby revoked, and the following substituted therefor:

2. Commanding officers of regiments and battalions, and of troops, batteries and separate companies having a medical officer, will organize ambulance corps in their respective commands, but the corps in existence at this date in accordance with general orders No. 36, of these headquarters, series 1887, will be continued under the provisions hereinafter prescribed.

For a regiment or battalion, the corps shall consist of the medical officers of the command, the hospital steward, and as company bearers three enlisted men from each company of seventy-five men, and two enlisted men from each company of less than that number.

For a troop, battery or separate company, the corps shall consist of the medical officer and as company bearers four enlisted men.

The details for company bearers will be made by the

commanding officer of the organization of which the corps is a part, upon the recommendation of his senior medical officer. The men selected must possess the ability and intelligence necessary for the requirements of this service. There may be included in the detail for a regiment or battalion not more than two corporals, and for a troop, battery or separate company not more than one corporal; but if a member of the corps should be promoted to a non-commissioned office he shall be allowed, if he so desires, to complete the course of instruction, and after he has passed the examination prescribed below, the senior medical officer may select him as one of the non-commissioned officers authorized.

Men detailed to an ambulance corps shall be relieved from such duty on the application of the medical officer having charge of the corps to which they are attached.

Whenever actual relief for sick or injured is required, the commanding officer will detail such enlisted men as have attended the course of instruction, and may also detail musicians for such service.

3. When on ambulance duty, or under instruction, the corps shall be under the immediate orders and control of the senior medical officer of the command to which it belongs, but no assignment or detail for duty with the corps shall relieve an officer or enlisted man from his regular duties, except when actually on duty with the corps in active service.

4. To prepare the members of the corps for their duties, the medical officer in charge will provide a course of instruction. This course shall commence in the first month of the drill season of each year and be held at least once in two weeks during such season. It shall be open also to such other members of the command of which the corps is a part as may be approved by its senior medical officer.

The dates, hours and places when and where the instruction will be given shall be published in orders to the whole command by its commanding officer.

5. The course of instruction, given by the medical officers of the command, shall include, for the present :

Rudimentary instruction in anatomy and physiology.
Rudimentary instruction in the diagnosis of the nature of accidents and disease manifestations to which national guardsmen are subject, and the common means for the prevention and treatment of the same.

Instruction as to the common means employed for the urgent relief of the sick and the injured, including stretcher-drill and matters pertaining to transportation of the sick and injured.

Instruction in individual and camp hygiene.

6. At the close of the course of instruction, the detailed men of the corps shall be examined as to their proficiency by a board to be appointed for that purpose as hereinafter provided.

The senior medical officer of each regiment, battalion, troop, battery and separate company shall keep a record of the name, proficiency and general standing of each member of the ambulance corps under his charge, from the time of the first attendance of the member to the termination of his course of instruction, also the result of his examinations, and the number of the badge if one awarded to him.

7. Commanding officers of the brigades will, with the approval of the Surgeon-General, appoint for their respective commands boards of examination which shall consist of not less than three medical officers, whose duty shall be to examine and report to the brigade commander as to the proficiency of the detailed men who have attended the prescribed course of instruction. The presiding officer of each board shall notify the commanding officers of the organizations of his brigade of the dates on which the board will be in session, and when they will examine the detailed men of the respective corps. These men shall then be ordered before the examining board by the commanding officer of the regiment, battalion, troop, battery or separate company to

which they belong, and those who pass the prescribed examination shall form the ambulance corps of their respective organizations, and remain members of the same subject to the approval of the medical officer in charge, and subject also to an annual examination by the board mentioned.

8. Enlisted men of ambulance corps, when actually on duty as such, are authorized to wear around the left arm above the elbow (non-commissioned officers as far above the chevron as practicable) an arm badge ("brassard") of white cloth, sixteen inches long and three wide, with a cross of red cloth two inches high and two inches wide in centre.

9. An enlisted man who has been detailed to an ambulance corps, and who has passed the prescribed examination satisfactorily, and has the approval of the commanding officer of the brigade to which he belongs, will be permitted to wear, with the consent of the commanding officer mentioned below, while a member of the corps, on dress and undress uniforms, and when in citizen's dress, the badge of the ambulance corps of this State, of the pattern heretofore issued, as an indication of special fitness to aid the sick and injured under urgent circumstances; this badge shall be turned into the regimental, battalion, troop, battery or company commander of the soldier, when the latter ceases to be a member of the organization, and such commander shall be responsible to the State for the same, and shall have the power for good reasons to refuse permission to wear or decline to issue the same to any one.

10. Details to fill vacancies in the ambulance corps will be made upon the recommendation of the medical officers, if possible from those who have attended the course of instruction, and who appear upon competitive examination to be best qualified for the duties.

11. When a member of the ambulance corps ceases to be a member of the regiment, battalion, troop, battery or separate company, he shall receive, from the Surgeon-General of the State, upon the recommendation of the medical officer and the commanding officer, as evidence of his special qualifications and ability to perform the duties of the corps, a certificate to that effect, which certificate will entitle the owner to receive instruction in the duties of the corps at regular intervals, and to be examined in the same, and to have the result of the examination indorsed on the certificate.

12. There shall be allowed and issued by the Chief of Ordnance, as Acting Quartermaster-General, in cases where such issue has not already been made, upon requisition made direct to him by commanding officers, stretchers of a pattern approved by the Surgeon General, at the rate of two for each regiment and battalion, and one for each troop, battery or separate company having a medical officer.

13. The Brigade Commanders and the Surgeon-General, and under him the brigade surgeons are charged with the prompt execution of this order, in their own sphere, and the latter and the Surgeon-General, in matters of instruction and advice, will communicate directly with the medical officers in charge of corps.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Adjutant-General.

Official.

—————Ass't Adj't General.

I will not detain you longer, as, it seems to me, sufficient has been said already to provide a substantial foundation for wise action in the future. Permit me, in conclusion, to offer the following recommendations for your consideration :

1. The requirement that all medical applicants should be caused, before entering the Guard in

the capacity of medical officers of commands, to pass an examination that shall be a rigid test of their ability to meet the demands of the position which they seek.

2. The requirement that all hospital stewards shall be fully qualified by law or by practice to dispense medicines intelligently and correctly.

3. The requirement that a suitable number of intelligent members of a command be instructed, examined, and be passed when proficient in the details essential to the rendering of "prompt aid to the injured," and of bestowing wise care on the sick.

4. The requirement that such worthy members be permitted to have in their possession a suitable badge, or other testimonial, at all times, as evidence of their ability.

In conclusion, permit me to express the belief that the formation of a scientific body from the medical officers of the Guard should be made secondary to the development of an efficient system of practical medical service in the Guard. And even then it seems to me that it can but be based upon an uncertain and fickle tenure, so long as no wise and judicious control can be exercised as to the *personnel* of its membership. It ought not to be overlooked that the commission bestowed by the State is the certificate of membership, not the requirements that few or many of the members may see fit to demand. Not to recognize a commission issued to its representative by a State or Territory is subversive of discipline, and can but lead, in my judgment, to dense demoralization, unmannerly bickering, and the breeding of life-long animosities, all of which are destructive of harmony and efficiency, and contrary to the laws and traditions of the service to which we belong.

BOOK REVIEWS.

A TREATISE ON THE DISEASES OF INFANCY AND CHILDHOOD. By J. LEWIS SMITH, M.D., Clinical Professor of Diseases of Children, Bellevue Hospital Medical College; Physician to Charity Hospital; Physician to the New York Foundling Asylum; Physician to the New York Infant Asylum; Consulting Physician to the Department of Children's Diseases, Bureau of Relief for the Out-door Poor, Bellevue; Consulting Physician to the Nursery and Child's Hospital, County Branch; Consulting Physician to the Infants' Hospital, Randall's Island. Seventh Edition, thoroughly revised, with Fifty-one Illustrations. Philadelphia: Lea Brothers & Co. 1890. Chicago: A. C. McClurg Co., 117-121 Wabash Ave. Price, cloth, \$4.50; sheep, \$5.50.

Six editions of this work have been presented to the medical profession. The seventh being in demand, the opportunity was given for a thorough revision of the entire book, of which Professor Smith has so fully availed himself, that not only has the volume been increased to nearly double its former size, but in its revision he has been able to incorporate recent investigations and

discoveries pertaining to the bacterial origin of many of the diseases of infancy and childhood—without which it would not meet the present requirements of the profession.

Very properly, in the first hundred pages, the subjects of food, bathing, clothing, sleep and exercise are dealt with, and in a manner highly satisfactory. Diseases of the newborn and constitutional diseases are very fully described, and in addition to the author's views as to their pathology and treatment, citations are freely made from a large number of our most accredited authorities bearing upon the affections successively considered. A special feature of the work is the prominence given to diseases of the cerebro-spinal system, while those of the digestive apparatus and of the circulatory system are amply delineated, and methods of treatment are very fully considered.

The careful consideration given to "new remedies" will be helpful to those not yet familiarized with their actions and the conditions in which their uses are indicated.

The present revision gives a greatly added value to the work, and, as in the past, it will continue to be one of our most reliable and helpful treatises on diseases of infancy and childhood.

PAINFUL MENSTRUATION. By FRANCIS HENRY CHAMPNEYS, M.D., M.A., Oxon., etc. Published by H. K. Lewis, London.

This little brochure of nearly 100 pages consists in substance of the Harveian lectures for 1890. The subject is not only an important one but in the author's hands has been developed into one of great interest. Unlike the majority of English authors Dr. Champneys has a succinct and practical style which is a *sine qua non* of medical monographs. The subject of membranous dysmenorrhœa received considerable attention, several large tables being appended which contain the complete bibliography of this interesting subject. The busy practitioner will find the work a valuable one.

PARKES MANUAL OF PRACTICAL HYGIENE (eighth edition) edited by J. LANE NOTTER, M.A., M.D. Published by P. Blakiston Son & Co., Philadelphia.

This is an old friend in a new garb. The work has been thoroughly revised and brought up to date. The standard character of the work is so universally acknowledged that it is hardly necessary to state that it is among the best works upon practical hygiene that have ever been published.

TRANSACTIONS OF THE 12TH ANNUAL MEETING OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION. Published by D. APPLETON & Co., N. Y.

This little work is a digest of the proceedings of the 12th annual assembly of the American Laryngological Association held in Baltimore, Md., May 29-31, 1890, inclusive, and is certainly suggestive of the enterprise and character of the members of this society—a well worthy emulation by other medical organizations. Its pages are replete with many well written articles on laryngological and rhinological topics, together with discussions thereon. Its initial article is in substance a very practical address by Dr. Jno. N. McKenzie, president of the society, who gives in outline the objects of the association and shows the practical and great good that has followed the organization. Altogether it may be said that the work can be perused with advantage by both the general practitioner and specialist.

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SATURDAY, SEPTEMBER 26, 1891.

SOME RECENT RESEARCHES REGARDING GASTRIC DISEASES.

The announcement of a New York publishing house that a translation of EWALD'S last work on gastric diseases is in preparation, is an indication of the growing importance of the teachings of the modern German school. We know of only a few instances where the diagnostic methods of EWALD and his followers have been employed in private practice, although in some of our hospitals they have already become an established procedure. Briefly stated, they consist in a withdrawal of some of the contents of the stomach at certain timed intervals, the analysis of these abstracted specimens by specially chosen tests, and in the administration of what are designated as "test-meals" which are subsequently to be chemically examined. No small part of the labor involved in the building up of this new system of diagnosis and treatment has been in the selection of trustworthy reagents that may be not too elaborate for ordinary clinical employment. In order to be successful the tests must not only be fairly accurate and demonstrative but they must be capable of easy application. In this manner, a more intimate acquaintance with the gastric juice, especially in its relations to the outflow of its hydrochloric acid component, is obtained. For example, this acid is not secreted

at once after the entry of food into the stomach, for during a period of half an hour to fifty minutes after food lactic acid is the only acid present, probably yielded by the carbohydrates and meat ingested. Hydrochloric acid then appears and the two acids coexist for a time, but hydrochloric acid should be the only one present from ninety minutes to two hours after ingestion. It is in that period that gastric digestion proceeds most actively, and after that function is performed the acid is not present in the stomach. The flow of hydrochloric acid may be retarded or hastened by the character of the meat taken; the carbohydrates, for instance, when in excess tend to repress its secretion, or a meal of cooked albumen only may cause it to appear as early as fifteen minutes after ingestion. With a mixed diet this acid will appear within fifty minutes, and will remain for two hours or longer in proportion to the size of the meal and the amount of gastric function called into exercise. The stomach should be empty three to four hours later, or five to six in all, although the health-limits vary greatly. Longer than six hours is nearly always beyond the period of changes other than those that are fermentative in part, at least; and after seven hours those changes only are observed. The "test-meal" may be either a breakfast, as preferred by JURGENSON, or a dinner as practiced by VON SOHLERN, and the time for collecting the gastric contents may extend from two hours to three and half hours after the meal. Milk is seldom used, as it has the property of mystifying results by itself combining with hydrochloric acid. The meal may consist of a little weak tea with bread and butter, and at times an egg. When the desired time has arrived for withdrawing the gastric specimen, a soft rubber nasal tube is passed either through nose or mouth into the stomach. The patient should be in the recumbent posture with head turned downwards; pressure with the hand is then made over the patient's stomach and he is directed to cough. Following this procedure—to be repeated if necessary—there flows through the tube some of the gastric fluid, which is collected in a flask for examination. VON JAKSCH recommends the use of the unfiltered fluid, but filtration is more commonly employed. The acidity of the filtrate—when the latter course is chosen—is determined by the reaction obtained by the addition of phenol-

phthalein and sodium hydrate in certain known proportions which enable the results to be read off in terms of hydrochloric acid.

The test for lactic acid is generally by means of UFFELMAN'S reagent of liquor ferri perchloridi with carbolic acid. The reactions obtained from these tests, from GÜNZBERG'S phloroglucian-vanillin test and from D. J. HAMILTON'S modification of LEO'S test for free acid are summarized in an article by DR. JOHN MICHELL CLARKE of Bristol, in the *Medico-Chirurgical Journal* of that place. The use of EWALD'S salol test has lost some of its currency within the past year, but it is still regarded as one of the useful means for approximating the digestive period. Salol is not changed in the stomach, but it is broken up in the duodenum into phenol and salicylic acid, and this latter passes without delay into the urine, giving the characteristic deep purple coloration on the addition of perchloride of iron. The argument of EWALD was that the time of its detection in the urine gauged the motor power of the stomach, but this time is subject to some variation. So that HABER states the test in another way; that is, he would formulate the gastric mobility from the time of the disappearance of the salol reaction from the urine. Normally the salicylic acid is no longer discoverable twenty-six hours after the meal, whereas in cases of impaired power it continues to respond to the iron test from thirty to thirty-six hours. The practical application of the knowledge obtained from these constantly improving lists of tests is of wide bearing both to dyspeptic functional difficulties and to organic lesions, such as dilatation of the stomach, gastric ulcer and carcinoma. As between gastric ulcer and cancer the test for hydrochloric acid is considered to have important differential weight, for according to our present light, that acid is generally absent in the latter affection; while in the former it is always present and is, as a rule, of increasing or increased secretion. KOLLMAR has recently pointed out in the *Berliner Klinische Wochenschrift*, that a negative reaction lacks several points of being pathognomonic of gastric cancer, since that reaction may be yielded in cases of persistent fever, of œsophageal and duodenal cancer, of amyloid degeneration of the gastric mucosa, of poisoning by acids, and not infrequently in catarrh from atrophy. A temporary ab-

sence of hydrochloric acid may occur in dilatation of the organ, but the acid tends to reappear after a repeated washing out of the stomach. So that, if the exceptions be borne in mind, the absence of hydrochloric acid is a strong diagnostic aid in cases where the existence of cancer is uncertain, but seems probable from the concomitant condition. In eight cases of cancer, observed by DR. CLARKE, in which he examined the gastric contents several times, in each case the acid was absent every time the examination was made. In one case, of especial interest, from the fact that the gastric walls were not the subject of extensive infiltration, the acid was not present, but the writer is not yet able to declare that the early stages of gastric carcinoma are marked by the negative test.

It is not contended for these methods of diagnosis that every case of dyspepsia should be submitted to its somewhat complicated ritual, but it will be a relief to not a few of our practitioners to observe the symplifying of the tests employed in the prospect of the utilization of some of them in difficult and rebellious patients and those resistant to ordinarily successful plans of treatment. These new methods become peculiarly acceptable where neoplasm or ulcer becomes suspected or as KOLLMAR has shown can take place, where the type of the lesion changes. Cancer may, although infrequently, develop in the cicatrix of healed ulcer, a succession noted by that writer not less than fourteen times. As a practical point, DR. CLARKE offers in the conclusion of his paper the suggestion that the soft india-rubber tube only be used, in entering the stomach without the stiffened end, such as is sold under the name of the JAKUES patent, which answers the purpose perfectly well and avoids the risk of doing an injury even in cases of ulcer.

ALIIS INSERVIENDO CONSUMOR: OR FOUR DECADES IN PRACTICE.

To one who, having borne the burden of the day, can sit down and write in jubilant strain of his professional life, his fellows and his juniors are constrained to listen. Such an one is DR. WILLIAM W. PARKER, of Richmond, Va., and President of his State Medical Society, and he the author of a most readable little address before the alumni of his medical college, delivered

April last. His subject was "Forty Years a Doctor," and it wavers like a pendulum between the joys and sorrows of his professional life, but always at the end in the consciousness of a race well run, and of much good done to others. Two more years of service finds him saying to his jurors: "Do not think that the bad treatment you have received is a lot exceptionally hard. All our predecessors, without one exception, have had the same hard fate. Nevertheless, I advise you to love all your patients from the start; it will make your work easier and more pleasant. Besides, it is your duty to trust, though you may be deceived." DR. PARKER evidently has that philosophy and kindly temperament which led a distinguished physician and magistrate of Amsterdam to adopt for his symbol the burning lamp, with the motto *Aliis inserviando consumor*. This was NICHOLAS TULPIUS, the central figure in REMBRANDT'S picture of the anatomical lesson. Gratitude may come to the physician for his self-consuming labors—"for there are those who gave us their confidence in early life and maintained it to the end, who are indeed jewels"—but that sentiment is not to be counted upon. Concerning the too frequent tendency to change from one physician to another, DR. PARKER says, "Many lives are lost yearly by a change of doctors." Another expression of his is, "The cooler you are, the wiser and safer you are; a highly nervous man is not fit for a doctor, nor a lazy man, nor yet a heartless man. Not to be bold and quick in emergencies is sometimes death to your patient." To the recent graduate he gives this advice: "So soon as you get your diplomas, get also a copy of the Code of Ethics of the American Medical Association, and carefully study it. It will teach you how to behave towards your medical brethren. I find that there is more need of the Code now than there was forty years ago. We are governed by the highest ethical code of any profession known to the world."

Many another striking remark occurs—too numerous for further quotation here—agreeable to all sensible minds, provided that they have not taken a prejudice in the opposite direction. Some of DR. PARKER'S observations are not wanting in eloquence, especially his little story about the largest fee he ever got, namely, the heartfelt thanks of a little orphan Irish girl of eight years of age: it is a hint for a great medical picture.

She simply said, "Thank God, here comes the doctor!" a cry which, the Doctor thought, went as straight to Heaven as that of any priest or seer, and he felt that even his name had been pronounced aloud and honored in the courts of Heaven.

Since the above was written another small pamphlet of DR. PARKER has fallen under our notice. It is from the transactions of the Virginia Medical Society, 1890, and treats of the rise and decline of homœopathy. One short paragraph we desire to select from it, for the purpose of illustrating the happy way our author has of touching up the subjects of his choice. He says: "It is very strange that HAHNEMANN did not see the defect in his new system, *since it excluded surgery, the most brilliant and useful branch of the medical art*. It is inseparable from the practice of medicine. No man can be a good surgeon who does not understand the action and use of drugs."

In conclusion, we may remind our readers of still a third paper by Dr. PARKER, published in these columns on June 6, an ingenious essay on the instinct of animals, taking side against the Darwinian argument about the "missing links" between human and animal intelligence. The bent of mind and flow of language seem to make literary work congenial to DR. PARKER, and if we are correct, we would encourage him to keep his pen ready to dip into the inkstand, as he from time to time conjures up the interesting scenes of the forty years of a doctor's life.

"AUGUST TWENTY-NINTH, THE POET'S DAY."

This is DR. HOLMES' day. His eighty-second natal day was quietly and comfortably celebrated at his home, and kindly remembered in hundreds of journals throughout the land. Some of the remarks of the editors were over kind and tended to become hyperbolic. What shall we say of such an effort as the one which represented that if HOLMES' time of departure from earth were to come, "Death will knock off work and cling to HOLMES' coat-tails, even though he knows that he will be stopped at the gate," but he will hang around on the outside, in the bare hope that HOLMES will not be satisfied with the heavenly choir, and will possibly like to return to earth again? HOLMES himself speaks more sensibly

and more to the purpose when he says: "My health is excellent. I am very well and very happy. My eyesight troubles me somewhat, so that I am very glad to avail myself of the services of a secretary, and I am a little troubled at times to recognize my friends and acquaintances on the street. Perhaps some of them may have thought that I have intended to cut them; but it is only a little trouble with my eyes which causes me to pass them. Other than this I have no physical trouble."

THE NATIONAL ASSOCIATION OF MILITARY
SURGEONS OF THE NATIONAL GUARD OF
THE UNITED STATES.

We have the pleasure of welcoming another National organization of medical men. The medical officers of the militia of the several States have during the past few years grown into the habit of forming State societies among themselves. But it occurred to PROF. NICHOLAS SENN, Surgeon-General of Wisconsin, that the time had come to unite the medical officers of the militia into a National Organization. Accordingly, on his call, representatives from sixteen States met in Chicago September 18, for organization. In the morning the gentlemen attended a brilliant clinic, held by PROF. SENN, at the Presbyterian Hospital, a gunshot wound very properly forming the subject-matter of the clinic. At noon, to the number of sixty, at the Union Club, they sat down to a delightful lunch, tendered them by the Faculty of the Chicago Polyclinic, after which they marched, as befitted their military character, to the Chicago Polyclinic, whose handsome amphitheatre, appropriately decorated, became the theatre of their deliberations. In the evening, PROF. SENN'S residence was the scene of a brilliant reception given in honor of the military guests.

All organizations of medical men are beneficial to the profession, if for no other reason than that they bring physicians together, and thereby broaden them and cultivate better feelings among them. In addition, each special organization has its special uses. The advantages arising from the present organization are peculiarly its own, and it will secure improvements which can be obtained through no other channels. The *personnel* of the militia surgeons has, in the past, been too closely connected with politics to be above re-

proach. Such a state of affairs will be largely corrected through this organization, for it will attract to itself only the competent men of the service. It will foster the study of military surgery, altogether too much neglected. It will emphasize the importance of the medical art to the State.

We were pleased to note the presence of medical officers from the regular army at the organization of this Society. Several very interesting and valuable papers were read before the Society, one of which, that of GEN. BRIANT, of New York, appears in our issue of this week.

The Association elected the following officers: GEN. SENN, President; MAJ. NELSON H. HENRY, of New York, First Vice-President; COL. E. CHANCELLOR, of Missouri, Second Vice-President; COL. MATTHEWS, of Illinois, Secretary; LIEUT. RALPH CHANDLER, Corresponding Secretary; and COL. T. T. CRANE, of Colorado, Treasurer.

St. Louis was selected as the next place of meeting.

PRELIMINARY MEDICAL INSTRUCTION.

A plan for guiding the work of the medical student during the year under a preceptor, before entering college, has been adopted by the College of Physicians and Surgeons of Chicago, which appears worthy of a wider employment. The students are matriculated in the same manner as are the resident students, and are required to make weekly reports of progress and pass satisfactory examinations. The subject-matter of the course, as will be seen from the following, is particularly commendable:

COURSE OF STUDY.—The study of biology and physics is looked upon by the faculty as the most desirable foundation for the study of medicine and surgery. It has not been thought advisable to duplicate the resident course, but rather to supplement it. The following outline will give an idea of the plan of study as prepared by the faculty:

1. BIOLOGY.—*a.* Invertebrate Anatomy and Physiology.

The lessons during the first month comprise the study of the fresh or salt water clam and the craw-fish or lobster. Dissections, drawings, and four written examinations.

b. Vertebrate Anatomy and Physiology.

The next three months will be occupied in the study of the frog, the hen and the rat or the rabbit, and other accessible vertebrates. Dissections, preparations, drawings and twelve written examinations.

c. Anatomy of Plants and Methods of Histological study.

The remainder of the year will be occupied in the study of the physiology of unicellular plants, germination, methods of histological study, and such other subjects as will be suggested in the progress of the initial course.

2. PHYSICS.—*a.* The reading of a suitable text-book on physics, weekly examinations during the whole course.

b. Experimental work which can be carried out at home with the material accessible in any village and with little expense.

3. LATIN.—It is recommended and expected that every student undertake at the same time the study of Latin under a competent teacher.

THE INFECTIOUS DISEASES INSTITUTE AT BERLIN.

The new institute, which is designed to be under the direction of DR. KOCH, at Berlin, was only opened August 17, and the first six patients were brought in that same evening. PROFESSOR BRIEGER has been appointed over the clinical department, and DR. PFEIFFER over the scientific laboratory. DR. BEHRING is among the assistants. The nursing has been assigned to the Brandenburg Sisterhood, a body ignoring all secular distinctions.

SOCIETY PROCEEDINGS.

Philadelphia County Medical Society.

Stated Meeting September 9, 1891.

THE PRESIDENT, JOHN B. ROBERTS, M.D., IN THE CHAIR.

DR. EDWARD JACKSON read a paper on

AN OPHTHALMOSCOPE FOR GENERAL USE.

It would be a great gain to both doctors and patients if a much larger proportion of those who class themselves as general practitioners were able, when the need for it arose, to use the ophthalmoscope. One who has no practical experience with it cannot even properly appreciate what he reads or hears of ophthalmoscopic appearances. And there are in the aggregate many cases in which the progress of general disease could be far more intelligently followed by its routine use, without entering upon debatable ground or attempting to use symptoms of doubtful significance.

With the ophthalmoscope, as with other instruments, the cheap instrument is very apt to lack certain important features, and the costly

instrument is mainly confined to the possession of those who mean to use it a good deal. It took many years to adapt the microscope to the needs of clinical work, to rid it of mechanical stages and other mechanical nuisances, and perfect its really essential parts. And the ophthalmoscope must pass through a similar pruning and adaptation before its use can be truly popular and common in the profession. For some years I have been working at this problem, and herewith present my results.

The ophthalmoscope for general use must, First, be one in which the difficulties of using the instrument are as far as possible overcome. Second, it must be one that will be as satisfactory as any of the best instruments for any case that is likely to be encountered. Third, it must be cheap. For this one I have no hesitation in claiming that with it the fundus of the eye can be seen as readily as with any ophthalmoscope heretofore made; for all practical purposes as a refraction ophthalmoscope, its lens series is complete; it can be bought for eight dollars.

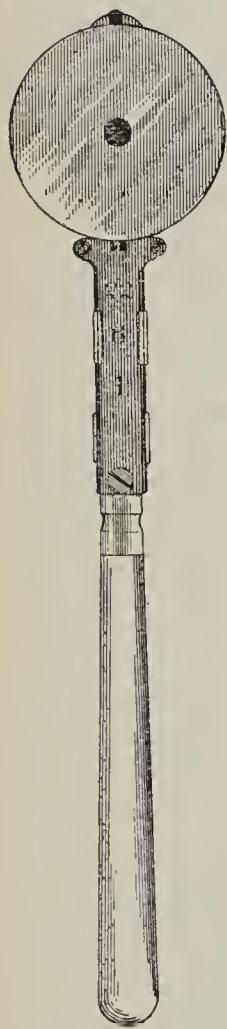
It is easy to see through, because the mirror, which is circular, 30 mm. in diameter, tilts each way to the best angle, at about 25 or 30 degrees; it has a shorter canal, and wider lenses than have most first-class refraction ophthalmoscopes; each lens is retained in exact position by a spring stop; and all the lenses or combinations of lenses are available without taking the instrument from the eye.

The lens series is furnished by combinations of six lenses in two slides, and consists of convex 1, 2, 3, 4, 6, and 12 dioptries; concave 1, 2, 4, 6, 10, and 22 dioptries. To appreciate this series one must bear in mind the degrees of ametropia that are commonly encountered in practice. Among 4000 eyes, the statistics of which I have published in the *Transactions of the American Ophthalmological Society* for 1889, only one eye had hyperopia of 13 dioptries, and only one eye had myopia of 23 dioptries.

The series does not contain half-dioptres, which are given in all the larger refraction ophthalmoscopes; but a very prominent ophthalmologist has recently said that he had the half-dioptre lenses taken out of his large instrument (Noyes's modification of Loring's) as comparatively worthless. Under especially favorable conditions there are a few ophthalmoscopists who have constant and extensive practice with the instrument who can, I believe, measure refraction with a little more exactness with half-dioptre lenses than they could with only whole-dioptre intervals. But the ophthalmoscopists that can do this are comparatively few, the cases in which they can do it are few, and the practical value of doing it is utterly insignificant. For those who are not in special practice half-dioptre intervals are always a delusion and a snare, a hindrance,

a cause of inaccuracy. They are, therefore, discarded.

Although the statistics above referred to show that in but one eye in 40 of those encountered in practice is the degree of ametropia over 6 dioptries, to one not very familiar with the properties of lenses the intervals between the stronger lenses of this series may seem too great. Such must be reminded that the effect of every intermediate lens strength may be obtained by slightly varying the distance of the lens and instrument from the patient's eye. Thus the convex 6 dioptre lens acts as such only when placed against the eye, by drawing it back less than three inches it is made to act as a 12-dioptre lens, and within that space will correct any intermediate amount of hyperopia. By withdrawing the 12-dioptre convex lens a little over one inch it takes the place of a 20 dioptre lens. On the other hand, by withdrawing the concave 22-dioptre lens a little over two inches its effect is diminished to 10-dioptries, and in that space every intermediate strength is reproduced. In the same way the withdrawal of the 10 dioptre concave lens to the same distance gives us the 6 dioptre effect.



When this is remembered it is readily seen that any measurement of refraction by strong lenses is utterly untrustworthy unless the distance of the lens from the eye is taken into account; and if it is taken into account, any additional intermediate lenses are quite unnecessary. The above series is sufficient for the direct method in all cases except the very highest myopia, for which the expert ophthalmoscopist is apt to resort to the indirect method as more satisfactory.

To one accustomed to using a disc ophthalmoscope the arrangement of lenses as here in slides will at first seem awkward and confusing, but to one who begins with this instrument, or who has already used an instrument in which the lenses are so placed, it is especially convenient. The convex lenses are all in the back slide, the concaves in the front. One can be used alone, or both slides can be moved at once by the tip of the same forefinger, according to the lens required.

In the focus of the mirror, the size of the sight hole, the blacking of it, the proportioning of the instrument, and its mechanical execution, it is equal to the best ophthalmoscopes now used. It is made by Mr. D. V. Brown, of Philadelphia.

Since this is not my first attempt at the modi-

fication of the ophthalmoscope, and another instrument has my name associated with it, perhaps it will prevent confusion if I exercise the right of naming this. And with the idea of giving it a name that shall by a single word indicate the idea of its design for general use, I shall call it the polyclinic ophthalmoscope.

MISCELLANY.

MISSISSIPPI VALLEY MEDICAL ASSOCIATION.—Preliminary announcement of the programme for the seventeenth annual session of the Mississippi Valley Medical Association, to be held in St. Louis, October 14th, 15th and 16th, 1891.

1. "The Toxic Effect of Tobacco Vapor; with Report of Cases." W. Carroll Chapman, M.D., Louisville, Ky.
2. "The Management of Chronic Diseases." S. Baruch, M.D., New York, N. Y.
3. "The Ethics of Curing Consumption and other Chronic Diseases." John Ashburton Cutter, M.D., New York, N. Y.
4. "The Treatment of Typhoid Fever." Robert C. Kenner, M.D., Louisville, Ky.
5. "The Carbolates." William F. Waugh, M.D., Philadelphia, Pa.
6. "On Degenerative Processes in the Spinal Cord Consequent upon Constitutional Diseases." Hugo Summa, M.D., St. Louis, Mo.
7. "Iliac Indigestion—Intestinal Dyspepsia—and its Treatment by Antiseptic Agents." Frank Woodbury, M.D., Philadelphia, Pa.
8. "The Influence of Graveyards on Public Health." J. W. Carhart, M.D., Lampasas, Texas.
9. "Rheumatism and Gout in their Casual Relation to Eczema; their Management." A. H. Ohman-Dumesnil, M.D., St. Louis, Mo.
10. "The Value of Epilation as a Dermato-Therapeutic Measure." Joseph Zeissler, M.D., Chicago, Ill.
11. "Gradation of Lenses." Dudley S. Reynolds, M.D., Louisville, Ky.
12. "The Influence of Alcohol on Vision." Francis Dowling, M.D., Cincinnati, O.
13. "Tobacco and Insanity." Ludwig Bremer, M.D., St. Louis, Mo.
14. "The Present Aspect of Cerebral Surgery." Leonard Carter Gray, M.D., New York, N. Y.
15. "Forensic Aspect of Bruises and Fractures in the Insane." J. G. Kiernan, M.D., Chicago, Ill.
16. "Amputation of the Scrotum, with report of a Case." B. Merrill Ricketts, M.D., Cincinnati, O.
17. "Observation on Urethral Stricture." G. Francis Lydston, M.D., Chicago, Ill.
18. "The Mechanical Element in Treatment of Compound Fracture." Warren B. Outten, M.D., St. Louis, Mo.
19. "A Report of a Case of Retention of Urine caused by Multiple Urethral Calculi." J. V. Prewitt, M.D., West Point, Ky.

20. "Some Observations on Rectal Surgery in Europe." Leon Straus, M.D., Louisville, Ky.
21. "A New Method of Diagnosing Obstruction in the Sigmoid Flexure." Jos. M. Mathews, M.D., Louisville, Ky.
22. "Pathology and Surgical Treatment of the so-called Strumous Inguinal Lymphadenitis." L. T. Riesmeyer, M.D., St. Louis, Mo.
23. "The Treatment of Gonorrhœa." E. C. Underwood, M.D., Louisville, Ky.
24. "Extirpation of the Thyroid, with Report of Case." Emory Lanphear, M.D., Kansas City, Mo.
25. "Are Conservative Amputations always in the Interest of the Patient?" Charles Truax, Chicago, Ill.
26. "Sarcoma of the Dorso-Scapular Region—Operation—Recovery." Geo. N. Lowe, M.D., Randall, Kansas.
27. "Mouth Breathing." Eric E. Sattler, M.D., Cincinnati, Ohio.
28. "Empyema of the Superior Maxillary Antrum, with only Nasal Symptoms." Hal Foster, M.D., Kansas City, Mo.
29. "A Superior Remedy for Nasal Catarrh; Campho-Menthol." Seth S. Bishop, M.D., Chicago, Ill.
30. "A Case of Reflex Aphonia; Demonstrated to be due to Pressure of the Middle Turbinate against the Septum Nasi." Hanau W. Loeb, M.D., St. Louis, Mo.
31. "Importance of Recognizing a Temporary Rachitic Condition in Infants." John A. Larabee, M.D., Louisville, Ky.
32. "A Pathological Study of Pelvic Inflammation in Women." Wm. Warren Potter, M.D., Buffalo, N. Y.
33. "Observation on the Management of Uterine Tumors." Chas. A. L. Reed, M.D., Cincinnati, Ohio.
34. "Complications Following Abdominal Section." Rufus B. Hall, M.D., Cincinnati, Ohio.
35. "Obstetric Dispensaries; their Management." L. A. Berger, M.D., Kansas City, Mo.
36. "Surgical Treatment of Peritonitis." A. V. L. Brokaw, M.D., St. Louis, Mo.
37. "Temperature no Guide in Peritonitis." H. C. Dalton, M.D., St. Louis, Mo.
38. "Some Monstrosities at and after Birth." David S. Booth, M.D., Belleville, Ill.
39. "Oöphorectomy vs. Donothingism." Willis P. King, M.D., Kansas City, Mo.
40. "A Successful Gastrostomy for Impermeable Stricture of the Cardiac End of the Oesophagus; Subsequent Dilation of the Strictures." Arch. Dixon, M.D., Henderson, Ky.
41. "The Nervous Equation of Pelvic Inflammation." Geo. F. Hulbert, M.D., St. Louis, Mo.
42. "Hysterectomy for Cancer." J. M. Richmond, M.D., St. Joseph, Mo.
43. "The Application of the Obstetrical Forceps." John Bartlett, M.D., Chicago, Ill.
44. "Appendicitis." W. H. Link, M.D., Petersburg, Ind.
45. "Phthisis; Beginning its Treatment." Edward F. Wells, M.D., Chicago, Ill.
46. "The Hydrotherapy in Typhoid Fever." H. H. Middlekamp, M.D., Warrenton, Mo.

47. "Hystero-Epilepsy." Howell T. Perching, M.D., Denver, Colo.

48. "Importance of Definite Strength in Mineral Waters." Geo. F. Hulbert, M.D., St. Louis, Mo.

49. "The Time and Place for Stimulants." By Chas. H. Hughes, M.D.

Regular classified programme will be issued and sent to members and the profession generally at an early date. Titles of papers must be sent to Chairman of Committee of Arrangements before October 5, 1891.

I. N. LOVE, M.D.,

Chairman Committee of Arrangements,
Grand and Lindell avenues, St. Louis.

E. S. MCKEE, M.D., Secretary.

C. H. HUGHES, M.D., President.

CONSTITUTION AND BY-LAWS OF THE MISSISSIPPI VALLEY MEDICAL ASSOCIATION.

Name.

ARTICLE I. This Association shall be known as the Mississippi Valley Medical Association.

Object.

ART. II. The objects of this Association are to foster, advance and disseminate medical knowledge; to uphold the honor and maintain the dignity of the medical profession.

Membership.

ART. III. Membership in this Association shall be limited to those members of the profession of medicine who acknowledge allegiance to the American Medical Association by signing its Code of Ethics. No individual who shall be under sentence of expulsion, suspension or disability from any recognized State, County, District or Local Medical Society, shall be eligible to membership in this Association until said disability shall have been removed. All applications for membership shall be referred to the Committee on Credentials. The annual dues shall be \$3, payable in advance.

Meetings.

ART. IV. The regular meetings of this Association shall be held annually. The place, with the time of meeting for each successive year, shall be determined by a vote of the Association.

Officers.

ART. V. The officers of this Association shall be a President, two Vice-Presidents, a Permanent Secretary, Treasurer, an Executive Committee consisting of the President, Vice-Presidents, Permanent Secretary, Treasurer, and the Chairman of the Committee of Arrangements; a Committee on Credentials consisting of five members, who may call to their assistance one member from each State represented at the meetings; a Judicial Council consisting of seven members, three of whom shall serve one year, and four for two years alternately. A Committee on Nominations which shall consist of one member from each State represented, shall be selected by the President on the second day of each annual meeting. It shall meet and nominate officers for the ensuing year, all of whom shall be elected on the last day of the annual meeting.

Duties of Officers—President.

The President shall preside at the meetings of the Association, and perform such other duties as parliamentary usage and the vote of the Society may require.

Vice-President.

The Senior Vice-President, or in his absence a Junior Vice-President, shall assist the President in the performance of his duties, and in the absence of the latter, or at his request, shall officiate in his place.

Permanent Secretary.

It shall be the duty of the Secretary to keep a list of the members of this Association with their addresses, to give notice of the meetings of the Association, to keep a record of its proceedings, to conduct its business correspondence, and perform such other duties as may be required.

Assistant Secretary.

It shall be the duty of the Assistant Secretary to assist the Secretary in the performance of his duties, and in the absence of the latter, those duties shall devolve upon him.

Treasurer.

It shall be the duty of the Treasurer to receive and disburse all moneys belonging to the Association. He shall pay out no money except on warrants signed by the presiding officer.

Committee of Arrangements.

The Chairman of the Committee of Arrangements may choose as many assistants as he may deem best, and appoint an assistant secretary, besides making all arrangements for annual meetings.

Changes in the Constitution.

ART. VI. This Constitution shall not be altered or amended, except the proposed alteration or amendment be first read on two consecutive days of a regular annual session of the Association and receive the approval of a three-fourths vote of all members present.

BY-LAWS.

ARTICLE I. The annual session shall be called to order by the Chairman of the Committee of Arrangements. The President on taking the chair shall call for the reading of the minutes of the previous meeting, and on the morning of each succeeding day of the annual session the following order of business shall be observed after the reading of the minutes.

1. Announcements of the Committee of Arrangements.
2. Report of the Secretary.
3. Communications from other Societies.
4. Reports of Committees. They shall be called in the following order. Committee on Credentials; Executive Committee; Judicial Council; Committee on Nomination during morning session of last day only.

ARTICLE II.

1. The provisions of Article I of these By-laws shall apply to the first thirty minutes of each morning session.

2. No essay or report shall be permitted to occupy more than twenty minutes without consent of the Committee of Arrangements.

3. Discussion of papers or reports presented shall be limited to ten minutes for each speaker and no member shall speak a second time except with the unanimous consent of the Association.

4. No essay, report or other communication presented to this Association shall be published in any but the

regular medical journals without the consent of the Executive Committee.

5. All questions of debate shall be decided in accordance with Cushing's manual of parliamentary law.

ARTICLE III.

1. All questions of ethics and differences between members shall be referred without debate to the Judicial Council whose report shall be final.

2. All questions of eligibility for membership shall be determined by the Committee on Credentials.

3. No person shall be allowed to participate in the deliberations of this Association who has not registered as a member and paid all dues.

ARTICLE IV.

These by-laws may be amended by a two-thirds vote of all the members present, provided the proposed amendment shall be made in writing and read aloud to the Association on two consecutive days at any annual meeting.

INVITED TO ATTEND THE UNVEILING.—The Secretary of the Illinois Army and Navy Medical Association has issued a call for the association to meet at the Grand Pacific Hotel, Chicago, the morning of Oct. 7 to participate in the ceremonies incident to the unveiling of the Grant monument. The invitation is also extended to all the medical men who served with the army and navy during the war to meet with the Illinois Association.

WANTED.—No. 4, vol. iii, July 26, 1884. Nos. 2 and 3, vol. xvi, Jan. 10 and 17, 1891. No. 3, vol. xvii, July 18, 1891. Will pay a liberal price for a few copies of each of the above numbers. Address this office.

LECTURES ON DISEASES OF THE URINARY APPARATUS are to be delivered by Dr. J. W. S. Gouley every Tuesday at 8:30 P.M., at the Mott Memorial Hall 64 Madison avenue.

These lectures, supplemented by clinics at Bellevue Hospital every Saturday at 3 P.M., will be free to the profession and students of medicine.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from September 12, 1891, to September 18, 1891.

Asst. Surgeon Louis W. Crampton, U. S. A., is relieved from duty at Ft. Sheridan, Ill., and ordered for duty at Ft. Townsend, Washington, relieving Asst. Surgeon James C. Worthington, U. S. A. Asst. Surgeon Worthington, on being relieved, is ordered to Ft. Thomas, Ky., for duty at that station, relieving Asst. Surgeon Geo. M. Wells, U. S. A. Asst. Surgeon Wells, on being relieved from temporary duty at Ft. Thomas, Ky., is ordered to San Carlos, Ariz., for duty.

Asst. Surgeon Geo. M. Wells, U. S. A., relieved from duty at Columbus Bks., O., and ordered to Ft. Thomas, Ky., for temporary duty, relieving Asst. Surgeon Henry I. Raymond, U. S. A. Asst. Surgeon Raymond, on being relieved, will report to the commanding officer, Ft. Robinson, Neb., for duty at that station.

Surgeon Charles L. Heizmann, U. S. A., is relieved from duty at Ft. Clark, Tex., and ordered to Ft. Douglas, Utah, relieving Surgeon William D. Wolverton, U. S. A., who, upon being relieved, will proceed to Ft. Schuyler, N. Y., and report for duty at that station.

Col. Edward P. Vollum, Chief Medical Purveyor U. S. A., retirement from active service is announced. S. O. 211, A. G. O., Washington, September 11, 1891.

Surgeon David L. Huntington, U. S. A., leave of absence extended to include September 30, 1891.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending September 19, 1891.

Medical Inspector A. A. Hochling, ordered as member of Medical Examining Boards.

Surgeon G. E. H. Harmon, ordered to the U. S. S. "Yorktown."

Surgeon Jno. C. Boyd, detached from the U. S. S. "Yorktown" and granted leave.

Medical Director F. L. DuBois, detached from Navy Yard, Portsmouth, N. H., and wait orders.

Surgeon J. G. Ayers, detached from U. S. S. "Wabash," and Navy Yard, Portsmouth, N. H.

P. A. Surgeon F. J. B. Cordeiro, ordered to the U. S. S. "Wabash."

P. A. Surgeon O. D. Norton, ordered to the U. S. S. "Petrel."

P. A. Surgeon E. H. Marsteller, detached from U. S. S. "Petrel" and granted leave.

Surgeon Jno. H. Hall, ordered to appear before Retiring Board.

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CHICAGO, OCTOBER 3, 1891.

No. 14.

ADDRESSES.

THE PRESIDENT'S ADDRESS.

Delivered at the Annual Meeting of the Congress of American Physicians and Surgeons, Washington, D. C., September 23-25, 1891.

BY CLAUDIUS H. MASTIN, M.D.,
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Address of the American Surgical Association:

At your last meeting, in May, 1890, you selected me to be your presiding officer at this session; a session of especial interest, because it is the occasion when the several special Associations jointly assemble to constitute the Congress of American Physicians and Surgeons.

Thoroughly appreciating the importance of the trust, and acknowledging the very great honor you have done me, I embrace the first opportunity which has presented, to thank you for this generous manifestation of your confidence and esteem.

It now becomes my pleasing duty to welcome you, together with our distinguished *confrères* from abroad who have honored us with their presence, to this, the beautiful capital city of this great, growing and prosperous Republic; a city surpassing in beauty and rivaling in grandeur the older and more favored capitals of the Old World; loved, both at home and abroad, for its intellectual and scientific advances, it is to become in the not distant future the centre of the science, the literature and the art of the Western hemisphere, as it is, even now, the political pivot around which revolve more than sixty millions of freemen! It is here that the Congress of American Physicians and Surgeons holds its triennial sessions, and it is the home of this Association. It is to this and to these that I bid you thrice hearty welcome!

Since the organization of this Association, a body having for its object the advancement of the science and the art of surgery, a decade has passed away, and with the opening of this session a new epoch in the history of the American Surgical Association begins. It therefore is a fitting time to take a retrospective view of our history, to congratulate ourselves upon the auspicious present, and linger for a moment in the contemplation of the future. This I conceive to be a more

appropriate theme for the occasion, than for me to weary your patience with a scientific dissertation—especially so, since the efficient committee charged with the preparation of the programme, has laid before you a feast rich in this particular.

It was in May, 1879, during the meeting of the American Medical Association, then in session at Atlanta, Ga., that the founder of this Association called around him a few selected friends, and disclosed to them a plan—which for many years had been a cherished object of his ambition—that of organizing an Association which should bear a National name, and embody in one harmonious whole the surgical talent, experience and wisdom of this great country. The question was pertinently asked, "What need is there of such an organization, since the country is full of all kinds of medical societies?" It was argued that the Surgical Section of the American Medical Association offered all the requirements necessary, and that the organization of a special Association, having for its object the advancement of the science and art of surgery, was not called for, and would be looked upon as having for its purpose only the injury of the old Association, striking, as it were, a direct blow at the Surgical Section.

With the far-seeing wisdom characteristic of the man, he thought differently, and believed the effect would be directly the opposite. He believed and said that the time had come in the history of medical and surgical affairs in America, when such an organization was a necessity, and should be created. He disclaimed then, as we do now, any opposition whatever to the old Association, and he asserted that it was impossible for any new organization to be in the least detrimental to it.

From the day on which the old Association was organized, he had been an active and influential member; once its President; often a contributor to its volume of Transactions; governed by its Code of Ethics. He remained true and loyal to all its requirements, as evidenced by the fact that when, on his death-bed, he was asked by a friend "what message he desired to send to the American Medical Association?" he replied, "Give them my love." Also the very last paper he ever wrote was being read in that Association.

tion, during its session of 1884, on the same day that he died.

It is my honest conviction that neither our illustrious founder, nor any Fellow of this Association, has ever entertained any sentiments of opposition to the old Association. On the contrary, as American physicians and surgeons, we feel an honest pride in the work that she has done, and we are the last who would obstruct the progress of an Association which is so necessary to the professional interests of the country at large. We are free to admit, however, that we know the time has come in the history of medical affairs in this country, when the special branches of the profession must be separately recognized. Not that they should be divided into departments having no reliance one upon another, but as integral parts of a great and undivided profession, they should be so organized as to stand "distinct as the billows, yet one as the sea." The Congress of American Physicians and Surgeons is simply a development of this principle.

But he was building even better than he knew, and now, the ten years which have passed so rapidly away have answered the question, "What need is there of such an organization?" The first regular meeting of this Association held for the transaction of scientific and practical work, took place at Coney Island, in the State of New York, in the September of 1881; a meeting which was attended by a very small number of its Fellows, yet the character of the work which was done was useful, and laid the foundation of the triumphant success which has since been attained.

Nomadic in its beginning, the next meeting was in the city of Philadelphia, on the 31st day of May and the 1st and 2d days of June, in the year 1882. At this session a fellowship of only twenty five were present, but the work was practical, full of zeal, and showed that the Association was to become, in the not distant future, an altar upon which would annually be laid valuable contributions to surgical science, and the world said, even at that time, its membership were destined soon to become earnest and zealous laborers in the interest of human progress and human suffering.

The third session was called together in the city of Cincinnati, on the 31st of May, 1883, and forty Fellows, all told, constituted its full strength. Its first volume of Transactions, which was published after that meeting, attests the amount and the value of the work which was accomplished. Everything then seemed to foreshadow a bright future, and nothing transpired to dim the occasion, save the absolute refusal of our beloved founder, and President, to accept a re-election to office.

That great man, the Nestor of modern American surgery, the founder and the cherished idol of this Association, Samuel David Gross, standing without peer and without reproach, held that

he had no preëmption right to office, and contented that he had occupied it long enough. He thought that his re-election would be at variance with the genius of our republican institutions and the habits of the American people. He believed that rotation in office should be the order of the day, not only among politicians but among scientists and professional men. He felt that his highest ambition as respected this Association had been accomplished. He appreciated clearly that the work which he began was exceeding most sanguine expectations, and was surely destined to pass into history. We knew that we were losing the guiding hand of a great pilot, and we were loth to permit him to leave the helm of office to serve in the ranks. In the language of a gifted Fellow of this Association: "had the constitution conferred upon us the power, we would have put on him the royal purple, and hailing him chief among all, have bid him wear it for life." But he was inflexible, and that meeting was the last he ever attended. Those of us who were present on the closing day of that session can never forget the trembling words and tearful eyes when he said: "Now that I am about to retire from the discharge of these duties I feel sure that the interests of the Association will be perfectly safe in your hands, and in the hands of my distinguished successor. I have no greater ambition than to live in your affection and esteem, and to witness the ever-increasing prosperity of this Association. Its success is closely associated with the remainder of my life. I believe that we have an Association which is destined to become a power for good in the land; and when I am dead and gone you will not, I am sure, relax in your efforts to make it what its founder intended it should be—a great and lasting institution. God bless you, gentlemen, in all the relations of life, and may you ever be faithful to the interests of the profession and the Code of Ethics in connection with which we have carried on our work."

Gentlemen, these were the farewell words of an old patriarch to his children, and they should sink deep into your memories, for they were spoken by a truly great man; one of those who are "born beneath the aspect of a bright-eyes star, and whose triumphant adamant of soul overcame but the fixed persuasion of success."

In less than one short year from that day he rounded up his great life and rested!

The future was before us. When from Cincinnati the Association took a new departure, and under the leadership of that venerable and great surgeon, Edward Mott Moore, we next assembled here, in the City of Washington, on the 30th of April, 1884. From that time it can truly be said "we have had a local habitation and a name." Time does not permit me to enter into the details of our annual sessions, which have

been held in this city each spring, nor to mention the interest and enthusiasm of our Fellows, which have made these reunions so pleasant and instructive as they have been. Suffice it to say, our successive and successful meetings from then till now, under the guiding hands of Moore and Briggs, Gunn and McGuire, Agnew, Cheever and Yandell, have gradually passed from small beginnings to the present prosperous and renowned Association which has assembled here to-day.

When this Association was first organized, anæsthesia had but enlarged the domain of surgery. To-day antiseptis, followed by asepsis, has emboldened the surgeon to undertake and perform operations hitherto deemed impossible.

Whilst anæsthesia had measurably lessened shock, antiseptis with asepsis have gone a step beyond, and done much toward the prevention of septic results, thus making the possibilities of surgery even greater.

In the last decade, the rapid and steady advances of the chirurgic art have far outstripped all other departments of the profession; and with the constant and seemingly never-ending improvements now going on in all the branches; the discoveries in chemistry, with the consequent additions to our materia medica; the revelations of the microscope, leading to a proper understanding of pathological lesions, and the clearing up of doubtful points in physiology, together with many new precisions in the study of all the branches of medicine, have enlarged the vista before us, so no one can predict the limitations which may not be reached in the next ten years. It was but yesterday when the closed cavities of the body were held as sacred—the organs within the abdomen, the lungs and heart within the thorax, the brain and spinal cord cased by the skull and vertebral column, were each surrounded by a dead-line which none dared to cross. To-day, they have each become the legitimate field into which the surgeon has carried his knife.

The Old World and the New World, shoulder to shoulder, have been busily engaged in blazing out the pathway from art to science. If our friends from abroad should ask what has been doing here in America, and what hand has this Association taken in the good work? I could tell them, if it would not be considered invidious for me to use names, what our Fellows have been doing in abdominal surgery; their operations upon all the organs contained in the abdomen; their improvements in the treatment of gunshot and other wounds of the intestines; their work done in the thorax, and show them that the brilliant achievements of Horsley, Godlee, Macewen and others across the Atlantic, in brain surgery, have been reproduced here with equal success. Even were it proper to do so, time would not permit me to enter into details of the brilliant work which has been successfully done by the

Fellows of this Association in all the regions of the body, both external and internal. Suffice it to say, American surgeons have not been idle nor non-progressive, and their work has been placed on record.

Whilst this Association has been advancing the cause of surgery, and doing much to alleviate the distress of suffering humanity, it is sad to have to relate that death has been busy in our ranks, and that some of our best and most eminent Fellows, even in the midst of their labors and the height of their usefulness, have fallen in their harvest and been gathered to their fathers. Their loss has proved a serious and irreparable one to the Association, no less than to the country.

Since our organization we have been called to mourn the loss of twenty-one of our brothers, among whom we chronicle the death of two ex-Presidents, four ex-Vice-Presidents, four members of the Council, and seven of our Honorary Fellows. Only a very small number have resigned; whilst on the other hand, the applications for membership have vastly exceeded the number of admissions.

It is indeed gratifying to know that those who have fallen from our midst were earnest and zealous laborers in the cause of surgery, and enthusiastic in their efforts to advance the best interests of this Association.

Now when we pause to drop a tear of sympathy and sorrow upon the greensward which covers them, we are solaced with the recollection of their many virtues, and the assurance that although they have passed to the great majority, they had reached eminence in their profession, and left behind them records of well-spent and useful lives. They live honored in our memories.

It is proper to mention that much of the success of this Association has been due to the indefatigable labors of our efficient secretary, who from the date of our organization to the present time has been distinguished for the unwearying and unselfish zeal which he has shown in the duties of his office, and he deserves the highest commendation for the work which he has accomplished. No less are we indebted to the recorder of the Association for his labors, for to him especially is due the editing and publication of the beautiful volumes of transactions which have followed our annual meetings. Lastly, though not least, all praise should be accorded to the Fellows themselves for their zealous coöperation in all the labors of our annual sessions, and their successful endeavors to make the Association what its founders intended it should be, "A great and lasting institution."

During the ten years which have passed so rapidly away, it will be observed that the Association has steadily advanced in prosperity and usefulness, winning for itself an honorable station among the learned societies of the country,

and claiming the admiration of those of the old world. Its volumes of yearly transactions are replete with valuable scientific productions worthy of their authors, and honorable alike to the Association and the Nation. Its membership comprising the leading surgical talent of the land, has fostered an *esprit de corps*, such as is to be found only among refined and agreeable gentlemen.

Bound together as we have been for ten years, new acquaintances have been made and they have ripened into friendships, old ones have been renewed and cemented; and to-day the American Surgical Association stands before the world an united brotherhood inspired with one sentiment, that of doing good to suffering humanity and advancing that department of the healing art to which they have consecrated their lives.

In this connection, a justifiable pride compels me thus publicly to say, from the day of our organization to the present hour, in all our public and private relations; in our intercourse with each other; in our scientific discussions and social reunions, there has not been one single occurrence, one harsh word to mar the harmony of the occasion or disturb the friendship of its Fellows. Verily this is a record, strange and unusual in the history of medical associations and deserves more than a passing notice.

Such in brief, is the outline of our past, and whilst we have every cause to congratulate ourselves upon the successful termination of the decade we are leaving behind, it is still necessary that we should comprehend the importance of the trust which has been placed in our keeping by the founders of the Association.

Holding in our hands its spotless record, it is a happy privilege to be able to feel that we desire its history hereafter to be, but a just development of that which has gone before; so that the ever opening pages of its future may continue to be lighted, as they now are, by a bright reflection from its past. Now let us, here to-day, join hands around this family altar, and renew our vows to make her still greater than she is.

Before closing, I beg to be permitted to make a few suggestions which I trust will not be taken in the light of criticism of the past management of the Association.

First, I suggest that a business committee be provided, whose duty shall consist in the preparation for and arrangement of the scientific work of the meetings; such a committee duly authorized would relieve the president and secretary of much labor and responsibility, and the work which they would accomplish would better serve the interests of the Association than if left to the will and pleasure of the presiding officer.

At the session of 1886, a resolution having this end in view was offered as an amendment to the by-laws, and under the rule was laid over for

one year: it however, failed to secure the approval of the Fellows at the session of 1887, and was finally tabled. I now recommend that proper action be had to the effect that the resolution of 1886, be taken from the table and passed, so that the by-laws will require a committee composed of the president of the Association, its secretary and the recorder, together with the two senior members of the Council, to take charge of the preparation of the scientific work of the Association. Their duties should be to select such subjects for the regular essays as they deem best, and have the appointment of those Fellows to lead in the discussions of these papers as in their judgement they believe will serve the best interests of the meetings. It should be fully understood, however, that all volunteer papers be left to the option of the Fellows without the interference or control of the committee.

Although there has not been as yet, any constitutional provision for such a committee, still we have had during the present session and the one immediately preceding it, the benefit of an unofficial committee which has been of vast service in the organization of the meetings, and I now take this opportunity to acknowledge my own indebtedness to them for the very valuable assistance which they have rendered to me in preparing the work of the present session.

Secondly. I suggest that our present limit of fellowship be increased from one hundred to one hundred and fifty. I am induced to make this suggestion entirely in view of the vast extent of our country and the large number of young surgeons throughout its wide domain, who are rapidly rising to eminence in their chosen branch. When this Association was first organized, it was then the part of wisdom that our restrictions should be limited, and our membership confined to a small select body of workers. Now the situation is different, and having passed the stage of adolescence we are prepared to extend our field of operations, and in doing so it is but proper that we should remove the obstruction of exclusiveness; with our present limit of membership we are arrogating to ourselves too much when we claim to be the representative body of American surgeons.

In this, I do not desire to be misunderstood, because I would urge that all due vigilance be exercised in the admission of new Fellows; the present high standing of the Association must be preserved. Age, scientific attainments, with surgical experience and general culture should be the necessary prerequisite for admission.

We have set up for ourselves a high standard and we can maintain it only by guarding our portals against unworthy applicants. Besides protecting ourselves, we must remember that each one of the conjoint Association is in honor bound to stand sentinel at the doors of the Con-

gress, and as membership in that body can only be had by virtue of fellowship in one or another of the special societies, it is a duty which each one owes to the other to protect the purity of the confederation.

It should be our aim and attainment to make the Association the representative body of surgical science in America; and to accomplish this most desirable end genuine ability and solid work must be the indispensable qualifications for admission; and continued scientific activity, the recognized duty of membership. With such a standard before the world, it will soon become a high and coveted honor to be known as a Fellow of the American Surgical Association.

Now leaving the larger views, I have expressed for a subject which should be nearer and dearer to us all, though not on that account a narrower sentiment, I ask your indulgence only a few moments longer.

It is well known to the world at large, no less than to the profession of which he was an honored member, that Samuel David Gross stood first in the foremost rank in his chosen branch of the profession, and that the high position to which American surgery has attained all over the world, is largely due to his example and his teachings.

Since he has passed away and his life work gone into history, we fully appreciate his real worth, and therefore it is his friends and admirers have been inspired to erect a monument to his memory. Such a monument as will bear testimony of their gratitude and be in the future an incentive to those who are to come after us, to like noble deeds. To further this praiseworthy enterprise, I suggest that a committee from this Association be appointed to confer with the friends and admirers of Dr. Gross and with the medical profession of the whole country to determine the best method to be adopted to secure the requisite amount for the erection of a monument either of marble or of bronze.

Such tributes to the memory of distinguished men are common both in this country and abroad; and when in our own profession, a man is found who has done so much to adorn it, it is meet that we should show to the world our appreciation of his work.

Dr. Gross was probably more widely known and appreciated than any American Surgeon of recent years, and when we remember that thousands of his pupils are scattered throughout the whole of America, men who sat under his teaching and who still retain of him the warmest memories, it is not expecting too much when we feel assured of their coöperation in raising speedily and without difficulty the requisite amount for the completion of such a monument.

I do not suggest that this work be done by the Association exclusively, nor would I advise it if

it could be. I would prefer to see it done by the profession of the entire country, because Dr. Gross belonged to no exclusive faction but was a member of the profession at large. It is proper, however, that this Association take the initiative in beginning the monument, and I feel assured that there will not be the least doubt as to the successful issue of the undertaking.

If any man in our profession has merited such a tribute, sure Dr. Gross was most eminently entitled to it; for he was a man animated by fervent attachment to the science and practice of his profession, and it was the duty of his life to augment and exemplify the resources of surgery; and by most assiduous and successful application of his time and his talents, his name has become known and honored, not only in his own country but in every land.

Appreciated and honored as he has been in life, let us now, since he is dead, build to his memory such a monument as will bear witness in after years to the estimate in which the profession of to-day holds its distinguished members.

If it were asked of me where such a statue should be erected, I would answer not at Easton, in the State of Pennsylvania, the place of his birth, neither at Cincinnati or Louisville, where he laid the foundations of his future greatness, nor even in the city of Philadelphia where that greatness culminated in all its grandeur; but here in the city of Washington, the capital of the country, which claims him as her own. His name and fame are a sacred heritage to the country at large, and to the profession he loved so well. Then, here in this beautiful city, amid these verdant parks and hard by these massive piles of classic architecture, let us place it among these statues, emblems of a nation's gratitude to her illustrious dead, her statesmen, her warriors, her jurists, her philosophers. Build it here, so that in the ages to come, when the youth of the land make their pilgrimages hither, they will behold the monument which their forefathers reared to commemorate the life and character of her greatest surgeon. It will teach them to emulate his example.

Thanking you for your kind attention we shall now proceed with the regular business of the Association.

TREATMENT OF THE VOMITING OF PREGNANCY.—The *Deutsche medicinische Wochenschrift* recommends the following treatment of pregnancy:

R.—Creasote, m. x.
Acetic acid, m. xx.
Sulphate of morphine, gr. i.
Distilled water, \bar{z} i.

A small teaspoonful every half-hour until four doses have been taken.

ORIGINAL ARTICLES.

NASAL CYSTOMATA—REPORT OF TWO CASES.

Read before the Section of Laryngology, Washington Meeting American Medical Association, May, 1891.

BY C. W. RICHARDSON, M.D.,
OF WASHINGTON, D. C.

Cystic tumors involving the mucous membrane of the nasal passages, *i. e.*, true retention cysts, are very rare, if one must form his opinion from the meagre number of reported cases, and the treatment received by this subject—or not received—in most of the classical works upon rhinology. Many of our standard authorities make no mention of this subject, either under a special caption, or under the general subject of mucous polyps. Bosworth in his great work upon the nose devotes one page and a half to the consideration of this neoplasm. Watson and Sajous devote a small space to the consideration of this growth, both referring to its rarity. Wagner reports Leffert's case *in extenso*.

Seiler, in a few lines, speaks of having seen this form of neoplasm and describes it "as large sessile cysts filled with the watery mucous and springing from lower border of inferior turbinate." McKenzie, Brown, Greville McDonald, Cohen, Ingals, Sturck, Votolini, Schech, Bresgen and Moldenhauer make no mention of the subject. In the literature which was accessible to me I found reported four undoubted cases of nasal cystomata, two of which were made by British and two by American observers. To Dr. George Johnson belongs the honor of having reported the first case, which is delineated in a most excellent manner, and with a most exact drawing, in the *London Medical Circular* for 1864. The other observers are Lefferts,¹ E. Fletcher Ingals,² and Reginald Horsley.³

Spencer Watson reports a case, under this heading, in the proceedings of the Medical Society of London, but in its description he shows it to be rather a cystically degenerated mucous polypus than a true retention cyst. In the second edition of his work upon the nose he acknowledges this fact in the following lines:

"In the proceedings of the Medical Society of London a case of mine is recorded which might be more properly described as a cyst-bearing polypus than as a cyst."

Carl Seiler, in referring to the report of Leffert's case, in the *Philadelphia Medical Times*, refers to having seen three cases, and reports another, a cystically degenerated fibroid growth. The latter could hardly be classified under this grouping. It is important to bear in mind that there is a marked difference between a true re-

tention cyst and a cyst formed by the degeneration of a solid growth. As Watson says, "It is not uncommon to meet with small adenomata which have been undergoing cystic degeneration, and the same is true of gelatinous polypus. With Johnson's, Lefferts', Ingals' and Horsley's cases which are reported in full, and Seiler's three, of which he only makes mention, we have, so far reported seven of these interesting neoplasms."

The pathological history of these growths within the nasal cavity, cannot differ from that of true retention cysts occurring upon mucous surfaces in general; being formed from retention of the secretion within the normal glands of the mucosa. The pressure of the retained secretion becoming great, an abnormal activity takes place within the gland, and it slowly or rapidly becomes transformed into a true cystic neoplasm. The seat of attachment of these growths is, as described by all authorities and as present in my two cases, on the outer wall of the nasal cavities between the middle and inferior turbinated bones, about 2 centimetres anterior to the mouth of the Eustachian tube. In four of the cases they appeared in the right, and in two in the left nasal cavities. They are pyriform in shape, of a grayish white color, resembling very much the ordinary gelatinous polypus. They have been observed at all ages, from the twentieth to the fiftieth year of life.

The symptomatology of this condition does not differ from that due to other obstructive diseases of the nasal fossæ. More or less catarrhal secretion is always present, with various degrees of obstruction to nasal respiration through affected passage. Owing to the valvular-like action of the growth, obstructing the post-nasal orifice, expiration is more difficult than inspiration. During respiration the patient feels a vibration and fro movement in nasal cavity, due to oscillation in growth produced by the impact of the incoming and outgoing column of air. Voice shows usual want of nasal character. Pain is usually absent; but there is always noted a disagreeable sense of fulness upon affected side, as though something foreign were in pharynx. Nasal reflexes may or may not be present. In Horsley's case asthma was a very pronounced symptom, which was relieved by removal of growth. By inspection, through anterior nares at the posterior portion of the passage cannot be seen a prominent reflex, moving during respiration. It is only through posterior rhinoscopy that the characteristic outlines of the growth can be observed. The tumor is seen as a large pyriform mass of a grayish white color, having very much the appearance of a mucous polypus, filling out more or less completely one post-nasal orifice. Ramifying over surface of neoplasm are numerous small blood-vessels. On sounding with a probe, it will be noted that the mass is firm

¹ Medical News, Philadelphia, 1883, xlviii, 653.

² Weekly Medical Review, Chicago, 1884, ix, 97.

³ Trans. Med. Chl. Soc. Edinburgh, 1889-90 N. S., ix, 43-51.

not pitting upon pressure, or presenting that soft, elastic feel of gelatinous growths.

Diagnosis.—The diagnosis of this condition should present no difficulty to the cautious observer. We have the evidences of obstructive nasal catarrh, unilateral in its character, gradual in its onset, and of varying time as to duration. The voice is markedly altered; and to that degree only present in complete obstruction of nasal cavities, or in interference with functions of velum palati. Direct inspection by anterior and posterior rhinoscopy shows existence of polypoid-like, pyriform neoplasms, projecting from nasal into pharyngeal cavity.

The differential diagnosis from mucous polypus is very simple. These gelatinous growths never spring from the seat of attachment of cystic bodies; they rarely ever grow singly, and before reaching the size of these bodies would have many companions; they are soft, indenting to the probe, never giving that firm, solid-like impression imparted by the cystic neoplasm.

From fibroid, sarcomatous and carcinomatous growths, the differential is so simple as not to require description. Is very rare and presents the characteristic pulsation.

Prognosis.—Removal is always attended with absolute relief. No recurrence has ever been noted.

Treatment.—The treatment to be adopted is that of removal of the neoplasm. The simplest method of removal, and the one likely to cause the patient the least discomfiture, would be the preliminary tapping of the cyst, and evacuation of its contents. The empty sac could then be blown forward into the nasal cavity by the patient, where it could readily be grasped by forceps, over which a snare should be threaded and the mass easily enucleated.

This proceeding had to be resorted to in both of my cases, although, I am sorry to say, after I had given them considerable discomfiture by attempting to remove the growth in its entirety.

Cases.—My first case came under my observation November 24, 1889. The patient was a young Hungarian, thirty-two years of age. For ten months past he had noticed a gradually increasing obstruction of right nasal cavity, which had, during the past two months, become almost absolute. He had no pain, although a feeling of discomfort, as though something foreign existed in nasal and pharyngeal cavities, was always present. The alteration of his voice was the condition that annoyed him the most. He is a professor of languages, and it was necessary that his voice should be good. During inspiration, a small amount of air could be drawn through cavity, but expiration was impossible. Left nasal cavity was clear. There was some post-nasal secretion. On examination by anterior rhinoscopy, there was nothing observed in anterior

portion of cavity to give any clue as to cause of interference with the normal function of this organ, but deep within the passage could be seen a reflex, indicating the probable existence of a polypoid growth. In the upper portion of pharyngeal cavity was observed a large pyriform, polypoid looking growth, bearing all the resemblance to a true mucous polypus. The base of the growth could only be seen, as it nearly filled out the whole pharyngeal cavity, above the soft palate. Digital exploration demonstrated the growth to be limited largely to the right side, with its seat of attachment within the nasal cavity. It was dense, non-elastic; not presenting the soft, gelatinous feeling of a mucous polypus. I was lost for a diagnosis. Removal was attempted by snaring through the nose, but while adjusting loop over the growth, with finger in pharynx, the sac ruptured, and the contents, a clear serum, was evacuated; the relief was complete. The patient, while clearing his nasal cavity of serum, blew the sac forward, and it presented itself at anterior nares. Supposing the mass to be free from its attachment, I grasped it with a pair of forceps, tearing off the base, which is here represented. Finding that still some remained, I threaded a snare over a pair of forceps, again grasped the mass, and enucleated it from its attachment. I failed to make measurements, but the growth, which has now been immersed in alcohol for eighteen months, speaks for itself.

My second case presented all the symptoms of the first, above mentioned. The patient was a young man of twenty-three years of age, a lithographer by profession. Had noticed obstruction for six months. The growth was not so large as in former case. The diagnosis was made of cystomata, and growth removed with same mishaps as in former case. Dr. H. L. E. Johnson kindly assisted me in first case, and Dr. H. B. Deale in second.

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LARYNGISMUS DUE TO A CONGENITAL VALVULAR FORMATION OF THE UPPER ORIFICE OF THE LARYNX.

Read in the Section of Laryngology and Otology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY J. H. BRYAN, M.D.,
OF WASHINGTON, D. C.

In this short communication it is my purpose to call attention only to that form of spasm of the infantile larynx due to a congenital valvular formation of the upper orifice of the larynx, a condition that is sometimes overlooked as a cause of noisy respiration in children.

In these cases there is a laryngismus of a mild variety, and as it is so very persistent, it is evident that it must depend upon some local cause. The

subjects of this condition may be perfectly healthy, showing no evidences of rickets or glandular enlargement—the most common causes of that severe form of laryngeal spasm known as laryngismus stridulous. There is no tendency to convulsions, and the respiration is noisy, or reedy, as described by some, being at times quite labored. The spasm is more persistent than in the severer forms of laryngismus, being present to some extent during sleep, and is greatly aggravated upon any excitement, such as sudden awaking from sleep, sudden change from a warm to a cold atmosphere, crying, change of position, dentition and gastro-intestinal disturbance.

According to Goodhart,¹ it was formerly supposed that at this stage of life, the larynx was too yielding, and that when a rush of air was produced by means of a deeper and more hurried breathing than usual, the air could not pass fast enough, and a noisy respiration was the result. From an observation made by Dr. Lees, an English physician, it appears to be due not so much to a yielding of the parts, as it is to a natural condition of them. He made an inspection of a case that died from other causes, and found that the epiglottis was excessively recurved in its vertical axis—"as if bent in half down its middle," thus bringing the ary-epiglottis folds almost in apposition, leaving a mere chink between them.

In 1878, J. Solis-Cohen² called attention to an allied, but much more serious condition, in which the epiglottis was abnormally long, and became incarcerated between the ary-epiglottis folds, causing suffocation. The two cases he reported terminated fatally.

Suckling, an English physician, in the *British Medical Journal* for December 15, 1890, reports one case in an infant 2 months old, and speaks of having observed this affection several times in very young children in the Children's Hospital, London.

Dr. Louis Starr, in a personal note concerning the case I herewith report, states that he has seen a number of cases showing the same congenital deformity, but in none were the symptoms so marked as in my case.

The prognosis of these cases is generally favorable, the difficulty with respiration passing off with the growth of the larynx. [In the way of treatment there is little that can be done, except to give tonics, and keep the child well nourished and free from all excitement.]

The following is the report of an interesting case, and illustrates well the condition I have just described:

In June, 1889, I was called to see a male child 9 months old, suffering from a spasm of the larynx that gave rise to a noisy respiration, and choking symptoms when nursing from the bottle.

The family physician informed me that when the child was 2 weeks old these symptoms were first observed, and they seemed to be increasing rather than decreasing as the child grew older. I was unable at this time to form any definite opinion as to the cause of the trouble, and it was not until I saw the case again at Oakland, Md., where I was called on account of his condition becoming much more aggravated, that I was able to assign any cause for the difficulty. At this time the respiration was noisy and could be heard at a distance of 40 feet or more, being at times distinctly spasmodic in character, and was as loud during sleep as in the waking state. When sleeping, the head was generally stretched back, so as to admit of the air passing in with as little resistance as possible. Examination showed no glandular enlargement, and no evidences of rickets. Other symptoms noted at this time were dilatation of the left pupil, sweating of the left side of the head and neck, phimosis with a very small preputial orifice, excessive irritability, and frequent eructations of undigested milk. It was then ascertained that the child's diet consisted of undiluted cow's milk.

Depressing the base of the tongue, the fauces were found to be congested, and the tonsils moderately enlarged. The epiglottis, as well as could be ascertained, was irregular in outline, and bent backward over the laryngeal cavity.

The spasm at times was so marked that I passed the index finger down to the upper laryngeal cavity, and pulled the epiglottis forward. After this manipulation, the child's respiration was natural for at least a week; but at the end of this period the spasm returned with its former severity.

This I believe to be an exaggerated case of infantile spasm of the larynx due to a binding of the epiglottis causing the ary-epiglottic folds to come almost in apposition, so that during inspiration there was a slight stridor produced. This difficulty with the respiration made a severe impression upon the central nervous system, which was greatly increased by the gastric irritation due to feeding the child with undiluted cow's milk, and also by that due to the phimosis.

The only treatment adopted was to dilute the milk, and to relieve the phimosis, which was done upon his return to Washington, by gradual dilatation. As soon as these sources of irritation were removed, the child commenced to improve as far as his general health was concerned, the respirations ceased to be spasmodic in character, and gradually became normal.

Another case that has recently come under my observation, was the 2 months old daughter of a professional friend. This child had the same characteristic breathing, but not to such a marked extent as in the first case.

No treatment was adopted, and in two months the difficulty had entirely disappeared.

¹ Goodhart, *Diseases of Children*, p. 592.

² Cohen on *Diseases of the Throat*, p. 627.

MOUTH BREATHING NOT THE CAUSE OF CONTRACTED JAWS AND HIGH VAULT.

Read Before the Section of Laryngology and Otology, at the Forty-second Annual Meeting of the American Medical Association, at Washington, D. C., May, 1891.

BY EUGENE S. TALBOT, M.D., D.D.S.,
OF CHICAGO.

Mouth breathing was not known among the early races, the present pure races or modern uncivilized races, neither are deformities of the jaws and teeth. You will all admit that mouth breathing is becoming a very common occurrence among our own people, and so are also irregularities of the jaws and teeth. It stands to reason, then, that the causes which will produce the one must necessarily, in many cases, produce the other.

In an otherwise able article upon the subject of "The Influence of Adenoid Hypertrophy at the Vault of the Pharynx Upon the Development of the Hard Palate," read before the New York Odontological Society, November 19, 1890, by Dr. D. Bryson Delavan, the author speaks of mouth breathing as a cause. He says: "The mouth breathing habit compels the constant dropping of the lower jaw, which, hanging by the cheek from the superior maxilla, causes constant pressure upon the upper jaw. This produces flattening of the lateral alveolar arches and shortening of them, in consequence of which there is not sufficient space for the eruption of the canines when they are due, and they therefore grow forward."

Other authors mention that sleeping with the mouth open produces tension of the buccinator muscle, this causing the jaws to contract, and they suggest different theories by which this pressure brings about the peculiar form of deformity. There are also very able gentlemen (specialists) teachers in our medical colleges, who are constantly bringing this theory before the students as a cause. This teaching has a tendency to defeat scientific investigation in the direction of ascertaining the real causes of the true condition found in obstruction of the nasal passages by assuming to place the real fact, namely, mouth breathing, as the cause. The students take it for granted that this is the cause and the only cause for this condition.

Let us look at a few facts as they have been presented to me in the constant study of the deformities of the jaws and teeth for the past fourteen years; and you, gentlemen, shall be the judge whether mouth breathing has anything to do with contracted arches or not. In the first place, let us glance at the parts involved. The superior maxillary bones are united at the median line. The outer surfaces have upon their border an alveolar process. Gray speaks of these two structures as one bone, the superior maxillary bone; but from the function, structure and

position of the alveolar process in its relation to the maxillary bone proper, they should be described as separate and distinct bones. The maxillary bones proper are made up of dense compact tissue, and are so arranged as to resist force. The outer surface of the bone is fortified and supported by the malar process, which is situated midway between the maxillary process and the canine eminence at the first permanent molar. At the canine eminence we have the strong thick plate of bone extending from the bridge of the nose to the alæ, the mesial portion forming the outer surface of the nasal cavity. We also observe that the nasal septum is situated at the centre of the nares and is attached to the maxillary bone at and along the place of union of the two halves of the maxillary bone. If a saw was passed through from one canine fossa to the other we should see that it involved the strong pillar of bone which goes to make up the outer surface of the nasal cavity. This strong pillar of bone is situated just at the point of the permanent location of the cuspids; this, together with the nasal septum, form a strong support to the hard palate. The maxillary bones are for the attachment of muscles and the resistance of force in masticating food. The hard palate does not assume the normal shape until the twelfth year, or after the teeth are all in position. The vault may be high or low, ranging from one inch above the margin of the alveolar process, between the second bicuspid and first permanent molar (which is the highest vault I have seen) down to one-quarter of an inch from the same point, which is the lowest vault I have observed. In either case they are normal, each variety depending upon the shape of the bones of the head for its peculiar form. The alveolar process, on the other hand, is made up of soft cancellated structure, and is solely for the purpose of protecting the germs of the teeth before they have erupted, and it also supports the teeth after they are in place in the jaw. From the time the teeth make their first appearance until they are lost, the alveolar process has developed and been absorbed three distinct times. The alveolar process, then, being solely for the protection and support of the teeth, it stands to reason that the position and shape of the alveolar process depend upon the location of the teeth. The bone proper, therefore, as we shall see later, is not influenced to any great extent by the movement of the teeth. The buccinator muscle is composed of striated muscular fibres, and is therefore under the control of the will. It is penniform in shape. It has its origin and insertion along the body of the jaws, above the alveolar process on the upper jaw, and below the alveolar process on the lower. It extends from the first bicuspid tooth anteriorly to the wisdom tooth posteriorly. The centre of the muscle would therefore be in one direction on a

line with the grinding surface of the teeth, and in the other direction at the first permanent molar. Its function is for the purpose of compressing air in the act of blowing, whence its name is derived, and also for the purpose of carrying and holding the food under the teeth during mastication. There are many cases of contracted arches where mouth breathing does not exist. There are also many cases of normal arches where it does exist. As all are aware, mouth breathing frequently commences very early in life; contracted jaws, on the other hand, never commence to form until the seventh or eighth, and in most cases the tenth year, except in cases of monstrosities, or from traumatic causes. When these conditions exist they are wholly unlike the usual contracted arches and can be diagnosticated at once, and therefore should not enter into this discussion. Contracted arches are of two kinds—V (Fig. 1) and saddle (Fig. 2)—all the other varieties being modifications and blendings of these two. It is apparent to every one that the cause which pro-

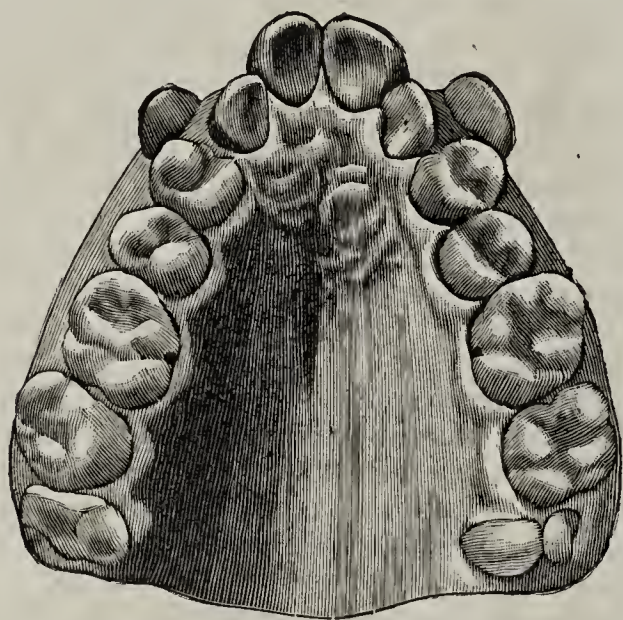


FIGURE 1.

duces the one does not produce the other. My observation has been that there are two-thirds more V and saddle-shaped arches among the low vaults than among the high vaults, taking $\frac{1.8 \cdot 77}{3 \cdot 2}$ of an inch as the average, but where one of these deformities exists with a high vault it is always more marked, for the reason that in the high vault the alveolar process is high and thin, and the teeth are more easily carried in one direction or the other, with very little resistance. In the V-shaped arch commencing at the first permanent molar, there is a gradual narrowing of the teeth and alveolar process toward the median line, where the incisors may reach a point or may stand in their normal position to each other. Invariably there is a protrusion of the teeth and alveolar process, and not the jaw. On the other hand, in the saddle-shaped arch the bicuspid are carried inward and the deformity is invariably situated between the first permanent molar and

the cuspid. Unlike the V-shaped variety the anterior teeth and alveolar process never protrude in this class of deformities. The contracted hard palate is always associated with the V-shaped variety, and in most cases extends backward to the second bicuspid. It is never seen with the saddle-shaped variety. The high vault is never seen in the first set of teeth, nor does it develop until the second set are all in place, which is at the twelfth year. The vault commences to slope slightly from the neck of the incisor until it reaches a line drawn across the roof of the mouth from the first right bicuspid to first left bicuspid, and then it gradually or abruptly slopes upward until a line is reached which is drawn across the jaw from the anterior surface of the opposite permanent molar. From this point posteriorly to the soft palate the dome is usually on a level; occasionally we see a slight depression and occasionally a slight elevation, but these are so slight as to escape notice unless one were looking for the peculiarity. In mouth breathing the lower jaw



FIGURE 2.

usually drops only sufficient for the passage of the same volume of air as would pass through the nasal cavities, which is only about one-half inch. Old people often sleep with the mouth open and frequently to the fullest extent, but these deformities of the jaws and teeth never occur after the eruption of the teeth, say at the twelfth or fifteenth year. When one opens his mouth he is conscious of a tension of the orbicularis oris, but not of a pressure of the buccinator, no matter how wide it may be opened. This muscle being under the control of the will is always passive except in the act of blowing or eating, therefore contraction during sleep is wholly out of the question. As the buccinator muscle extends anteriorly to the first bicuspid only, it can produce no effect upon the V-shaped variety of deformity, in which is also found the contracted vault. Therefore the only deformity that is likely to be produced is the saddle-shaped variety, which is out of the question for reasons which I shall

explain later. The orbicularis oris muscle cannot produce the contraction, because when the mouth is open the pressure exerted on the six anterior teeth is backward. Thus the teeth are carried in the opposite direction from that which must be taken to produce this deformity. Again the pressure is just as great upon the incisors as upon the cuspids, thus holding them in place. More force is exerted by the orbicularis oris upon the six anterior teeth when the mouth is open than can be exerted (if it were possible) by the buccinator muscle, which would tend to hold the anterior teeth in place. For years it has been demonstrated by dentists in regulating teeth that it is very rare for the apices of the roots of teeth to move when pressure is brought to bear upon the crowns of teeth for the purpose of regulating them. This being the case, teeth having long roots like the cuspids are less liable to move than teeth with short roots like the lateral incisors and bicusps. Since in the moving of a tooth the greatest change which takes place is at the neck, it stands to reason that the greatest absorption and deposition of bone takes place at that point. The roots of the cuspid teeth are larger and longer than any other teeth in the jaw; unlike other teeth the germs are situated considerably higher and farther toward the outside of the alveolar process, so that when they come close into position they diverge from the apices to the crowns, while all the other teeth stand nearly or quite perpendicular, thus showing that the roots of these teeth do not influence the hard palate. I have shown that the first permanent molar and the teeth posterior to them are never involved. I have also shown that the centre of the muscle in both directions is located at this tooth. How is it possible, since all the teeth are covered by the muscle upon one side, that half are carried inward and the other half remain normal? Again, if mouth breathing is the cause of the contraction, both sides must contract alike, and the deformity must be uniform upon both sides, which is never the case. Muscles do not contract to a degree sufficient to produce the pressure necessary to produce a deformity. It is inconsistent with our knowledge of the influence exerted by muscular structure in other parts of the body. Some of the muscles of the chest exert much more pressure in respiration than it is possible for the buccinator to do, during sleep, yet no one would expect to find the ribs modified by this process. The pressure of the tissue upon the crown of teeth is not sufficient to affect the alveolar process through the roots of the teeth, but even if it could modify those spongy structures its force would stop there, and would not extend to the osseous vault, bending it out of shape. In most of these cases the superior maxilla and the diameter of the alveolar process and teeth is very much smaller than the inferior max-

illa, alveolar process and teeth; in such cases the muscles and cheek could not reach the teeth and alveolar process upon the upper jaw. This is always the case in the worst forms of irregularities. The changes which take place in bone are not a bending in at one place and forcing out at a weaker point to compensate for the space lost, but are an absorption and deposition of bone at the point of pressure. And even if such were the case the strong pillar of bone situated at the very point of contraction of the alveolar process, together with the nasal septum, both form a strong bulwark for the resistance to the pressure which is situated quite a distance from the top



FIGURE 3.

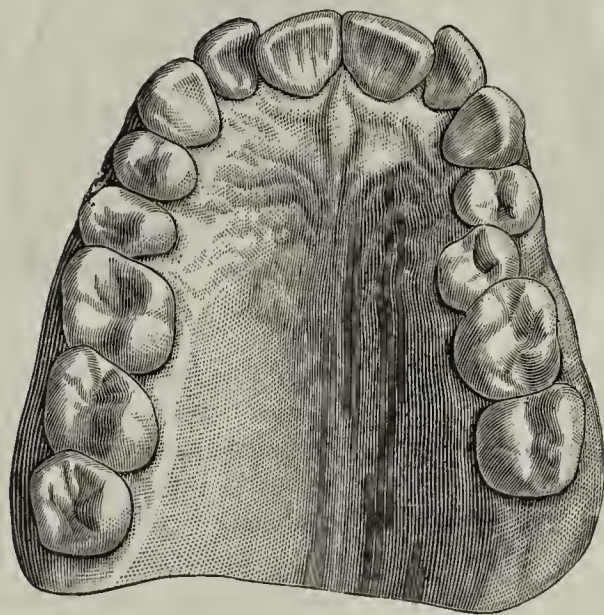


FIGURE 4.

of the vault. Again, it would be as impossible to produce pressure sufficient to break the dental arch as it would be for the weight of a building to break the arch of a door or window. The tongue exerts a much greater force in the act of swallowing and would prevent the inward movement of the teeth if so slight a pressure as the muscles of the cheeks were the cause of the deformity. For the sake of the argument, let us suppose it were possible for the buccinator muscle to produce this contraction; we should then expect to find the modification of the osseous structures

uniform. This would shut out semi-V (Fig. 3) and semi-saddle-shaped arches (Fig. 4) entirely, and a majority of other irregularities of the teeth in which there is bilateral asymmetry, for however much one would incline to the prevalent theory, no one would dare to assert that the muscle will act on one side of the mouth, while that on the opposite side remains passive. Partial V- (Fig. 5) and partial saddle-shaped arches (Fig. 6) make it still less plausible. In these we meet with sudden bends inward where only one or two teeth may be involved, which could only be produced by a centralization of force on one given point or fibre of muscle, a peculiarity of function that has never yet been ascribed to muscles. The muscle being penniform in shape, it would be impossible for one or two fibres of the muscle to exert its influence upon a bicuspid. It would naturally lap over two or more teeth. Lastly, if the buccinator acts as all muscles uniformly throughout its extent of contraction, below its median line it is just as effi-

dle and partial saddle-shaped arches we find the alveolar process built up about the teeth in the precise uniformity to the nature of the shape of the arch. If we take 3,000 models of the upper jaw and arrange them in groups according to the forms here represented and then examine very closely the arrangement of the teeth in each group, we will be unable to find any two alike in either group; thus showing that an external force acting upon the jaws from the outside could not possibly be a cause. If it were possible all the models of one variety would resemble some exact form. Dr. Delavan says that "The prominence of the anterior region of the alveolar arch is still further increased by the projection forward of the superior maxilla at this point, and of the upper teeth." The doctor is quite mistaken as regards the "projection forward of the superior maxilla." The maxillary bone never protrudes in front in this class of cases, it is only the alveolar process which is carried forward by the projecting teeth. The only tissues involved in these

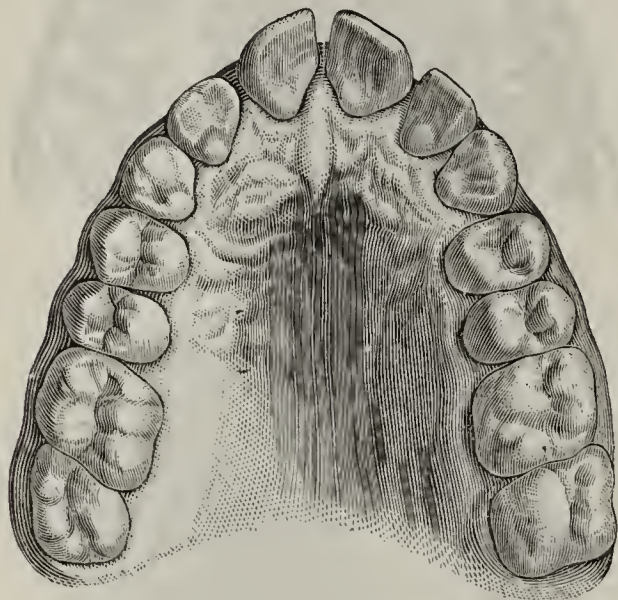


FIGURE 5.

cient in producing a narrow contracted arch as in its upper portion, and we should expect to find the lower maxilla contracted whenever the upper one is, which is contrary to facts. A V-shaped arch can never occur upon the lower jaw, if the teeth articulate normally, because these teeth strike inside of the upper, and are thus prevented from moving forward. A saddle, partial saddle and semi-saddle arch may occur on the lower jaw, but these deformities are not often seen. When they do occur they are the result of improper occlusion with the teeth of the upper jaw. We always observe in semi-V and partial V-shaped arches that the alveolar process is contracted upon the side of the deformity. If one side is contracted more than the other we shall observe that the alveolar process is contracted in proportion to the amount of deformity; the vault on that side is not carried up beyond the other side, which is normal. In the saddle, semi-sad-



FIGURE 6.

deformities are the teeth on the one hand, and the alveolar process on the other.

In most cases the cause of these deformities is arrest of development of the maxillary bone. This condition is due not only to hereditary influence, but also to direct causes, such as the eruptive fevers and all lesions which are constitutional and which produce long sickness. When arrest of development of the superior maxilla takes place we always notice a depression at the alæ nasi and a sunken condition of the bones of the face on the line drawn from ear to ear, and occasionally extends up to the floor of the orbits. If we will examine closely the faces of an audience in Chicago we shall observe that from forty to fifty per cent. of all these people have this arrest of development of the superior maxilla. Such being the case, arrest of development must necessarily extend to the bones of the nose, thus producing mouth breathing. Ziem has frequently shown that if one nostril of a rabbit be permanently closed and the animal killed after it has attained its full growth, the nasal cavity of

the affected side will be found to be undeveloped and asymmetry of the face will take place. Arrest of development of the bones of the nose, and hypertrophy of the bones and mucous membrane will ensue as a result. A good illustration of hypertrophy of mucous membrane from want of use is observed by dentists when the gums puff up, thicken and extend one-half to three-fourths of the length of the teeth from want of brushing. It would be useless for any one to say that mouth breathing is the cause of one case of V-shaped arch in every twenty, and that some other cause produced the rest of the deformities. We must have a law which will work in all varieties of contracted arches as well as the V-shaped, which variety constitutes a very small percentage of the whole. I have watched the development of these different varieties for the past fourteen years, have taken impresslons of the mouths of some of the most marked cases every three months and

compared them. I have also produced most of these forms in the movement of the teeth for the purpose of correcting deformities.

I regret that it will be impossible at this time to show how these different forms of irregularities of the teeth are produced, but they are nicely described and illustrated in my work upon "Irregularities of the Jaws and Teeth and Their Treatment." I will, however, say that they are caused by the long diameter of the dental arch being too great for the long diameter of the superior maxilla. Having then discovered the cause (that of arrest of development of the maxillary bones) of contracted jaws and irregularities of the teeth, have we not a good foundation to work upon to discover the cause of deflected septum and mouth breathing?

The following table will explain the difference in the height of vaults, both in normal and defective jaws :

HEIGHT OF VAULT—NORMAL JAW.

$\frac{7}{32}$	$\frac{8}{32}$	$\frac{9}{32}$	$\frac{10}{32}$	$\frac{11}{32}$	$\frac{12}{32}$	$\frac{13}{32}$	$\frac{14}{32}$	$\frac{15}{32}$	$\frac{16}{32}$	$\frac{17}{32}$	$\frac{18}{32}$	$\frac{19}{32}$	$\frac{20}{32}$	$\frac{21}{32}$	$\frac{22}{32}$	$\frac{23}{32}$	$\frac{24}{32}$	$\frac{25}{32}$	$\frac{26}{32}$	$\frac{27}{32}$	Total No.
I	270	171	169	146	159	182	69	199	429	936	218	514	150	568	149	427	69	75	12	4614	

Average, $\frac{18.771}{32}$ of an inch.

SADDLE-SHAPED ARCH.

$\frac{7}{32}$	$\frac{8}{32}$	$\frac{9}{32}$	$\frac{10}{32}$	$\frac{11}{32}$	$\frac{12}{32}$	$\frac{13}{32}$	$\frac{14}{32}$	$\frac{15}{32}$	$\frac{16}{32}$	$\frac{17}{32}$	$\frac{18}{32}$	$\frac{19}{32}$	$\frac{20}{32}$	$\frac{21}{32}$	$\frac{22}{32}$	$\frac{23}{32}$	$\frac{24}{32}$	$\frac{25}{32}$	$\frac{26}{32}$	$\frac{27}{32}$	Total No.
				1				3	5	5	6	5	4		3	5	5	1	1		44

Average, $\frac{19.47}{32}$ of an inch.

V-SHAPED ARCH.

$\frac{7}{32}$	$\frac{8}{32}$	$\frac{9}{32}$	$\frac{10}{32}$	$\frac{11}{32}$	$\frac{12}{32}$	$\frac{13}{32}$	$\frac{14}{32}$	$\frac{15}{32}$	$\frac{16}{32}$	$\frac{17}{32}$	$\frac{18}{32}$	$\frac{19}{32}$	$\frac{20}{32}$	$\frac{21}{32}$	$\frac{22}{32}$	$\frac{23}{32}$	$\frac{24}{32}$	$\frac{25}{32}$	$\frac{26}{32}$	$\frac{27}{32}$	Total No.
			2		4	1		3	8	3	15	4	9		5	1	2		1		58

Average, $\frac{17.89}{32}$ of an inch.

SEMI-V AND SEMI-SADDLE-SHAPED ARCH.

$\frac{7}{32}$	$\frac{8}{32}$	$\frac{9}{32}$	$\frac{10}{32}$	$\frac{11}{32}$	$\frac{12}{32}$	$\frac{13}{32}$	$\frac{14}{32}$	$\frac{15}{32}$	$\frac{16}{32}$	$\frac{17}{32}$	$\frac{18}{32}$	$\frac{19}{32}$	$\frac{20}{32}$	$\frac{21}{32}$	$\frac{22}{32}$	$\frac{23}{32}$	$\frac{24}{32}$	$\frac{25}{32}$	$\frac{26}{32}$	$\frac{27}{32}$	Total No.
1					1		1		3	3	5	1	4	2		2		1			24

Average, $\frac{18.15}{32}$ of an inch.

TREATMENT OF HYPERTROPHIED TONSILS BY MEANS OF IGNIPUNCTURE.

Read in the Section on Laryngology and Otology at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY GILBERT I. CULLEN, M.D.,
OF CINCINNATI, O.

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There is probably no disease with which the laryngologist has to deal with more frequently than enlarged or hypertrophied tonsils, and consequently a successful method of their treatment, trust, will prove of interest to all.

This condition, while not presenting the unfavorable prognosis of many forms of throat disease, yet I think will at times prove quite as distressing and a source of as much discomfort to the patient, as some of the most serious maladies with which we come in contact. As it is not the object of this paper to present the various forms of hypertrophy or disease of the tonsils or their attending symptoms, I will not enter into a consideration of these points except where they bear a direct relation to some of the principles upon which the treatment is based.

The galvano-cautery possesses the power of filling a double vocation, that of completely dissecting the tonsil and that of merely reducing it in size by the cicatrization of the tissue of which it is composed.

Relative to the first function might be mentioned, the able contribution to this subject by Dr. Pynchon, who, in a paper read before the Chicago Medical Society, October last, clearly described his method of the complete removal of an hypertrophied tonsil by means of a thorough dissection with the galvano-cautery electrode. I would thoroughly endorse this means of complete removal of the gland whenever the indications for such action present themselves. Where it is desirable to employ a galvano-cautery snare, I would recommend the one made by Hazard & Co., of New York, as undoubtedly the safest and most practical instrument that has been devised for this purpose, and should be used where the tonsil is so located as to enable its application and in cases in which excessive hæmorrhage is anticipated.

In the selection of the electrode for puncture, I use one to correspond with the size of the lacunæ, and one that requires some slight pressure to insert it into the crypt. Cocaine is first applied to the tonsil, and a solution of from 4 to 10 per cent. being used, either in combination with phenol as recommended by Gluck, or the pure cocaine, either of which will insure immunity from all pain or discomfort during the procedure. I prefer the addition of phenol to the cocaine solution, as I think the constitutional effects of the latter are less, and the degree of anæsthesia greater.

The electrode should be inserted to the depth of the lacunæ or follicle of the tonsil, and two or three punctures in close proximity should be made at one sitting, to be repeated in from three to six days, as the condition of the gland will warrant. This to be followed by a soothing antiseptic spray of menthol, resorcin, or a modification of the well known Dobell's solution, which formula is somewhat improved by substituting bichloride of mercury in the strength of from 1 to 1,000 to 1 to 4,000 for the carbolic acid, tr. ferri chlor., and glycerine, equal parts; and many others might be mentioned.

Pynchon makes use of the bicarbonate of sodium in saturated solution, and if the after-inflammation become severe, he uses a mixture composed of tincture of iron and chlorate of potash in glycerine—one dose, containing from 6 to 12 minims of the iron and about 4 grains of the potash, every 2 hours. This treatment I have found to be very satisfactory in a number of cases. In cases of after-hæmorrhage from galvano-cautery puncture, which are *very rare*, I order the patient to take a sip of a mixture composed of tannic acid 2 parts and gallic acid 1 part, with sufficient water added to render it the consistency of a thick cream; this has invariably checked the hæmorrhage at once.

In operating it must be borne in mind that the external carotid artery is about three-fourths of

an inch from the tonsil and the internal carotid about one-half inch; these distances may be materially increased by traction upon the organ, as it has been demonstrated that the cellular tissue between these arteries and the tonsil is elastic and yielding and does not draw the vessels with it when traction is made upon it.

Sajous says that the soft form of hypertrophied tonsils will yield the best results from this method of treatment.

One of the principal advantages of this method of operating is its comparative freedom from danger either from hæmorrhage or septic infection. It is well known that, although exceedingly rare, alarming hæmorrhages from operations upon the tonsils have occurred, cases being reported by Agnew, McCarthy, Velpeau, Delavan, Max Thorner, and others, some of them necessitating the tying of the carotid artery in order to check the bleeding. The advantage of the cautery knife always being surgically clean is also a most important point, as it can readily be appreciated that the electrode, although reeking and loaded with germs, is rendered perfectly aseptic the moment the current is turned on. The process of sterilization being performed by the only perfectly reliable germicide—heat.

The degree of heat used is that of a moderate red, the knife being allowed neither to cool to a black heat before its removal from tissue, as pain and hæmorrhage will result, nor to attain anything like a white heat, as in that case the pain will be more severe and the danger of injuring surrounding tissue greater. Lennox Browne recommends that the knife be used either at black heat or a dull red, and considers anything approaching bright red or white heat as positively dangerous and to be avoided under all circumstances.

I make use of the finer pointed electrodes for the puncture and the flat knives for smoothing off any ragged edges or surfaces that may remain.

After trying all makes of batteries, I think the new Edison-Leland gives promise of proving the most satisfactory, as it requires absolutely no attention until entirely run down, while the process of manipulating it is the same as that of a storage, viz.: simply close the switch on electrode and the current is made, no lowering and raising of elements, and it will run a light steadily for about 8 hours. This battery also serves admirably for the purpose of operating my motor.

The main indications for reduction of tonsils by galvano-cautery might be summarized as follows:

1. When tonsils have ceased to perform their function by reason of interstitial thickening and occlusion of the lacunæ of the glands, in which condition the mouths of the crypts becoming blocked with the accumulation of sebaceous matter, which rapidly decomposes, they form an ex-

cellent culture medium for various pathogenic germs which may ultimately be absorbed into the lymphatic system.

2. That when a tonsil shows itself competent at short intervals to become inflamed and give rise to peritonsillar abscess.

3. Where the tonsil is so situated that it is a matter of great difficulty as well as danger to use the tonsillitome, and from extensive adhesion of the pillars, likely to cause severe hæmorrhage by their being cut.

4. In all cases where the patient is of a hæmorrhagic diathesis or in other cases in which alarming hæmorrhage is feared.

5. Where patients will not consent to the use of the knife and yet the demand for the removal of the gland is imperative.

NOTES ON ARISTOL IN THE TREATMENT OF THE DISEASES OF THE NOSE AND THROAT.

Read in the Section of Laryngology and Otology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 6, 1891.

BY WENDELL C. PHILLIPS, M.D.,

ASSISTANT SURGEON TO THE MANHATTAN EYE AND EAR HOSPITAL, THROAT DEPARTMENT, NEW YORK.

Nearly every month a new antiseptic is presented to the medical profession, each claiming to outdo all its predecessors and to be perfect in all its attainments.

But experiments have proved most of them to have one or more obnoxious qualities that greatly interfere with their usefulness in the sphere for which they have been recommended.

One, if used in sufficient strength to become a true antiseptic, is found to be a local irritant.

Another corrodes the instruments and unless great care is used will poison both the patient and the operator.

A third is accompanied by an odor so pungent and disagreeable that few patients will submit to it, and the usefulness of still another is greatly lessened by the staining to hands and clothing that results from its use.

All of the earlier antiseptics were handicapped by their poisonous qualities, and consequently could only be used to a limited extent.

Aristol, one of the more recent ones, possesses some qualities that have attracted the attention of various observers, and a combination of the drug has been suggested by the writer that is bringing about good results both in nasal and in general surgery, and which will be described in a later part of this paper.

Aristol is a combination of iodine and thymol, and is known as an iodide of thymol.

It was first suggested by Drs. Messinger and Vertman, of Aix-la-Chapelle, as a substitute for iodoform.

It is described as a "fine yellowish red powder which is inodorous and nontoxic."

It is insoluble in glycerine and very sparingly in alcohol, but very soluble in ether, chloroform, and fatty oils.

It is decomposed by heat and by light, and after decomposition its odor is similar to that of iodoform. Reports of its use, in the treatment of diseases of the skin, ear and mucous membranes of the nose, throat, and vagina, have come from various sources and the consensus of opinion is that it is nontoxic, and that its antiseptic properties are equal to, and in some cases superior to iodoform.

Lowenstein¹ used it in three cases of simple ozæna by insufflation and says "after a few days the fetor had disappeared, the formation of crusts was reduced and the headache ceased".

He has also used it in solution with ether in the proportion of a dram to the ounce with good results.

Hughes² also used it by insufflation in nine cases of rhino-pharyngitis, accompanied by ozæna, and reports great relief in all the cases; the fetor was greatly reduced, and the crusts were easily removed. He believes it to have the power to stimulate the secretion of mucous membranes.

Rhorer³ reports twenty cases of acute catarrhal otitis media, treated with insufflations of aristol in powder and notes that the secretion is quickly reduced in quantity; the mucous membrane of the middle ear becomes smooth, and the swelling disappears in a few days; the perforation heals if there was no great loss of substance.

Brocq⁴ reports a case of large ulcerating superficial epithelioma of the face rapidly cicatrized by the use of aristol, and believes it to possess the power of causing rapid cicatrization superior to anything that has heretofore been used in similar cases, but does not consider it a specific for the disease. He further remarks "that the most remarkable evidence of the cicatricial power of aristol is observed in superficial ulcerations of a tuberculous origin."

Thus in a case of elephantiasis of the foot the ulcerations, which had been treated for a long time with lactic acid, camphor, naphthol, and iodoform, respectively, were cicatrized within a fortnight by the application of powdered aristol.

Another tuberculous ulcer developing on an old scrofulo-tuberculous cicatrix, has been healed in twelve days.

It has also been used by Gaudin, Seifert, Erchhoff, Schirren, and Neisser in various skin affections.

The method of using it has been chiefly in

¹ Int. Klin. Rundschau, May, 1890.

² Dr. Med. Woch: 1890, Nos. 10 and 19.

³ Archives internationales de Laryngologia, 1890, No. 2.

⁴ Bull. and mem. de la société, médicale des Hôpitaux de Paris, May 1, 1890.

powder, but in some instances it has been made into ointment, in varying proportions and, when a solution was required, in ether, chloroform or flexible collodion.

My experience with the drug dates from August 1890. I first used it at the Manhattan Eye and Ear Hospital in solution with flexible collodion in the proportion of a dram to the ounce.

Several cases of chronic atrophic rhinitis with ozæna, one case of syphilitic ulceration of the septum, and one case of simple ulceration of the septum were treated with this solution by means of a cotton probe.

In the cases of ulceration of the septum the results were good, and healing was accomplished in both.

In the case of ozæna (and I speak of ozæna as a symptom, not as a disease) the results were not so satisfactory but were sufficiently good to warrant a further use of the drug. The odor was very much lessened after a few days treatment and the secretion became less inspissated.

These comparatively favorable results led to the conclusion that if aristol could be brought more thoroughly into contact with the entire surface of the diseased membranes, far more could be accomplished both in correcting the disagreeable odor and perhaps destroying the cause of it by bringing the membrane into a healthier condition.

To bring this about, no matter what remedy is to be used it stands to reason that it must be brought into contact with the entire diseased surface, and as a rule, a very large surface of the nasal tract is in a diseased condition in cases of chronic atrophic rhinitis.

The anatomy of the nasal cavities with their various projections, depressions, processes and fossæ, is such that a thorough application cannot be made by a cotton probe.

Treatment by insufflations as recommended by several of the gentlemen previously mentioned is preferable, and I have resorted to it in several cases, but found it difficult to make a thorough application without using a large quantity of the drug, much of which would be wasted, and its expense will not allow of waste.

It has become an axiom in the treatment of nasal diseases that, of all the methods resorted to for local medication, none are to be compared either for convenience, thoroughness, or effectiveness, with the spray.

Believing this to be true and believing also that, if aristol could be used in the nasal cavities by means of a spray, much more could be accomplished in the treatment of the cases under consideration, I endeavored to get a solution of the drug that could be used for spraying and would at the same time remain permanent.

Knowing that the liquid petroleum products have deservedly largely taken the place of aque-

ous solutions for spraying purposes; and knowing also that the same principles that obtain when menthol, eucalyptol, etc., are used in solution with liquid petroleum would hold good with aristol, I succeeded in having a solution made that is applicable for spraying purposes.

Aristol is not soluble in any form of liquid petroleum, but with care a solution can be made by first dissolving the aristol in a small quantity of pure almond oil, afterwards adding the liquid petroleum.

A solution of thirty to forty grains to the ounce answers for all nasal requirements. It is well to flavor with a little oil of wintergreen.

I have treated twenty-two cases of ozæna with the spray as above described. Twenty of these are the ordinary type of this condition, one is due to inherited syphilis with an obstruction due to a deflected bony septum, and with a partial adhesion of the soft palate to the posterior wall of the pharynx, and the other case is supposed to have a piece of zinc plate imbedded in some portion of the nasal tract which I have been unable to find. In this case the odor was so fetid that the patient could detect it herself.

In fact, all of these cases are of a severe type, and presented large collections of inspissated crusts. At the first visit the crusts were removed before using the aristol spray, but afterwards little was done except to use the spray.

The patients are taught how to use the spray properly at home and are directed to use it night and morning. Much depends upon the way it is used, and patients should be instructed to inhale the spray.

The results so far obtained have been similar in all the cases.

The odor of the breath in every case has entirely disappeared in from two to five days, and has not returned, but the cases are still using the remedy. Consequently it is impossible to state how permanent this result is. However, if the ozæna can be held in check only by the daily use of aristol, more is accomplished than ever has been done before.

The formation of crusts, has, also, been greatly lessened in every case; a fact that is probably due to the stimulation of secretion caused by this drug.

It is certainly true that aristol excites a copious secretion from all mucous membranes, but the secretion is less noticeable from the nasal than from other membranes, notably the urethra.

This power to induce a more copious, and therefore a healthier secretion lessens the formation of crusts, and by so doing it also lessens the odor which comes from the decomposition of the secretion.

This result tends to a healthier condition of the membranes because the secretions do not remain in contact with them until they decompose.

I venture to predict that if aristol proves to be possessed of actual curative properties in catarhal diseases the results will come from its power to stimulate secretion as well as from its disinfectant properties. That it is a useful agent cannot be denied, but conclusive judgment cannot be passed until it has been given a longer trial.

161 East 37th St.

PHYSICAL CULTURE A NECESSITY.

Introductory Lecture delivered at Rush Medical College, Chicago, Sept. 29, 1891.

BY JOHN B. HAMILTON, M.D., LL.D.,

Gentlemen :—I am deputed by my colleagues to bid you welcome to these halls, and to this oldest medical school of the Northwest.

It ushers in its forty-ninth annual course, with every prospect that the new requirements of advanced general scholarship, as preliminary to admission, are being well met, and that a solid advance has been made in the attainments of the medical students of this metropolis.

We welcome you, then, as more nearly *frater* than *discipulus*, and it will be understood that the educational seed sown hereafter will fall upon soil well prepared, and coming as you do from different environment, and perhaps to a more artificial life, I do not know that I can on this occasion render you a better service than to direct your attention to the necessity of caring for your body not less than for your minds. The mental digestion of a student corresponds very closely to the physiological digestion, and many a man has failed to become a learned man from physical disability alone.

You may occasionally read of a soured misanthropic dyspeptic like Carlyle; whose mental activity is very great; but such a person is an exception, a veritable *lusus naturæ*. The rule is that the better care taken of the body the more perfect the mental processes. Dyspeptics are usually made, not born such.

As preliminary, then, to the study of the practice of the art, I will for this evening's lecture take up the subject of

PHYSICAL CULTURE, ANCIENT AND MODERN.

Within a few years there has been much said in America on the subject of physical education. It had begun to be apparent that, with all our boasted progress in wisdom, in general intelligence, and in the arts and sciences, we had omitted from our curriculum any study having for its object the systematic training of the body.

The body cannot become a perfectly working machine without culture or training, any more than the mind can become intellectually expert without that drill which we call education. We do not look for able logicians in those who have not had mental exercise. We ought not to ex-

pect sound bodies in persons whose every free and natural movement has been repressed in childhood, cramped by fashion, and neglected throughout life.

It is not a pessimistic view of the case to consider that one-fourth of our population of military age probably could not pass a physical examination as recruits. It is probably within bounds to say that a majority of persons thus disqualified have become so from neglect of muscular exercise. The hollow-chested consumptive was not long since the type of the scholar, and the moral of this lesson was to teach people to avoid schools, for fear of the production of physical deformity or imbecility. It was this feeling that college graduates were unfitted to deal with the rough elements of daily life in the world, that brought about the changed sentiment whereby our colleges now encourage manly sports and exercises. Like all reforms, when once instituted it may go too far, yet with all our knowledge on the subject, few private or public primary schools devote any appreciable time to the cultivation of sound bodies. This is left to chance. What would become of the mind similarly neglected? Are we prepared to admit that the mind is inferior to the body? We cultivate and stimulate one, and mortify and neglect the other. The brain cannot live without the spinal cord and sympathetic ganglia, and healthy, active circulation is necessary to cause clear, vigorous, mental actions. Is it not then of first consequence that our primary education should begin with training the muscles, the nerves, the eye, the ear and the hand at the same time we commence to stimulate the brain by precept.

"*Ut sit mens sana in corpore sano.*" "Let me have a sound mind in a healthy body," says Juvenal, in his prayer to the gods, and there is but little doubt that the ancients thoroughly understood the philosophy of the case; but it was "professionalism" that ruined the Grecian gymnasium and transformed the manly athlete into a commercial harlequin, or a repulsive brute.

The physical welfare of the people has been one of the chief cares of states since the organization of governments among men. First for physical self defence, and second for conquest, and it has been found that where the highest types of men existed, there also were found examples of the highest type of the human intellect. The poetry of Homer grew on the same soil that produced Leonidas and his hardy veterans, and viewing Greece as a whole, without reference to the internecine wars and minor differences which separated it in states, we may truthfully affirm that the same civilization that produced the Spartan may justly display at Athens the art of Praxiteles and Phidias, the eloquence of Demosthenes, the wisdom of Socrates, the jurisprudence of

Solon and Spartan Lycurgus, the logic of Aristotle, the learning of Plato and Euclid, the incomparable skill of Hippocrates, the histrionic art of Æschylus and Euripides, and the histories of Xenophon and Herodotus. What would Greek sculpture have been, had it not been for the athletic exercises that gave form and symmetry to the human figure in the times contemporary with the productions of the immortal statuary? If the muscles of the Homeric heroes were unduly prominent, was it not gigantic intellect that recorded their prowess? Was it not phenomenal skill that chiseled their likenesses in enduring marble?

The Roman warriors were also contemporary with her orators, although the art of the period was wholly Greek.

With luxury and idleness came physical and mental decay.

Loss of physical strength was accompanied by general depravity. When Lycurgus forbade the art of writing in Sparta he at the same time did not neglect to stimulate the mind by requiring the laws to be memorized and transmitted by the mouth, and although in our times such rigorous rules as those by which the Spartans were governed would be unendurable and unnecessary, it is evident that they were adapted to their times, and that they succeeded not only in developing the ancient Doric character, but in gaining Lacedæmonian ascendancy. The Spartans indeed valued the sound body to the most extreme degree. No other Grecian state ever found it necessary to destroy the deformed children. The Spartan custom required that the new-born child should be carried to certain examiners who held court (*Lesche*) *λεσχῆ*, where the infants were carefully viewed; the well-formed and strong were ordered to be cared for, the puny or delicate or misshaped ones were condemned and "cast into a deep cavern in the earth near the mountain Taygetus, as thinking it neither for the good of the children themselves, nor for the public interest that they should be brought up, since nature had both denied them the means of happiness in their own person, and of not being serviceable to the public, by not endueing them with a sufficient measure of health and strength." (Potter, *Grecian Antiquities*.)

While the Greeks in general were not inclined to follow the Spartan custom of destruction, yet the children of the poor were "exposed," and it may well be believed that it cost a less pang to expose a deformed than a healthy infant. When the child was to be educated, the whole scheme was comprised in four parts, grammar, music, gymnastics and the art of drawing and painting. Gymnastics, however, were considered of transcendent importance, and this part of the period of education occupied as much time as all the other branches. The legislation of Solon was

particular in regard to the gymnasium, and there was a superintendent called a gymnasiarch who was a civil magistrate, having jurisdiction over the gymnasium, and all who frequented it. This gymnasiarch had power to remove any teacher or philosopher, in his discretion, when he found any such person having an injurious effect on the youths. Under the direction of the teacher (gymnastes) such kind of gymnastic exercise was selected as seemed best suited to his peculiar constitution. Galen has mentioned these teachers and it appears they were informed as to the physiological effects of exercise upon the body in general, and the best means of correcting physical defects, whether of malformation or development.

Sprengel refers to this topic as follows:

1. "The games of the Greeks had an immediate influence on the art of war, because gymnastics were cultivated for the conservation of health, and as well by the physician to cure diseases. It is for this reason that the gymnasia were consecrated to Apollo, the god of the physicians, and many of the persons employed were of their order. The *Alliptes* bore the name of physicians, and they treated by this means the lighter ailments."

Herodotus, a pupil of Agathinus, who practiced medicine at Rome in the reign of Trajan, and who was zealous in the pneumatic sect, recommended all the gymnastic exercises, especially horseback riding, in acute diseases, oil baths, swimming in the sea, and mineral waters.

The learned Oribasius, who flourished in the fourth century, who was one of the most elegant of the ancient medical compilers, had very clear ideas on the importance of physical education of children—ideas which are well worthy of attention to-day. He thought the physical education should always precede the mental education.

The famous surgeon, Antyllus, recommended singing as an exercise to develop chest capacity in pulmonary diseases; and in later times the surgeons may fairly claim the credit of bringing gymnastics once more prominently to the front as a remedial measure, and, as a sequence, its modern revival. Ambroise Paré, the great French surgeon, who flourished in the sixteenth century, again proposed massage as a revulsive in cases of wounds of the head, and Sabbatier, in 1772, published an interesting work on ancient gymnastics. No surgeon has surpassed Sabbatier in learning, nor did any in his time surpass him in practical handicraft.

Tissot, of Switzerland, in 1780 published a work entitled "Medical and Surgical Gymnastics."¹

But it is not intended to include a study of medical gymnastics as within the scope of this

¹ *Gymnastique Medicinale et Chirurgicale.*

lecture. Suffice it to say, that as a therapeutic resource it has well-defined uses, and we see in the modern *masseur* the enthusiast in this branch. Those interested will be amused and instructed by a glance at Moritz Schreber's little volume, published in London, Edinburgh and Leipsic in 1856. Instructed by some of the measures proposed, and amused at others, such, for instance, as the radical cure of hernia by muscular movements. As for the *masseur* himself, has he not invaded the entire medical territory? With his "Swedish movement," and his mechanical "system," his weights and pulleys, and his little hammer and tongs, he is certainly much abroad in the land. (Pardon this digression — this "excursus," as good old Becker puts it in Charicles and Gallus.)

Let us return to the Greek gymnasia. The same general system was pursued throughout Greece, but whereas in Sparta the gymnastic exercises were looked upon as a necessary basis for the military training and the hardships of the field, in Athens the higher, broader view was taken, that the gymnastic exercises were necessary not only to make expert and hardy soldiers, but as giving strength, beauty and health to the human body, and making it nearer the divine image.

It may be interesting to give a part of Vitruvius' account of the construction of the Greek gymnasium.

I follow Gwilt's translation :

Of the Palæstra (indoor gymnasia) :

Though not used by the people of Italy, it seems proper that I should explain the form of the palæstra, and describe the mode in which it was constructed by the Greeks. The square or oblong peristylia of palæstra have a wall around them which the Greeks call "διὰυλοζ," two stadia in circuit. Three of the sides are single porticos; the fourth, which is that on the south side, is to be double, so that when showers fall in windy weather, the drops may not drive into the inner part of it. In the three porticos are large recesses (exedrae) with seats therein, whereon the philosophers, rhetoricians and others who delight in study may sit and dispute. In the double portico the following provision is to be made: the ephebum is to be in the middle, which is in truth nothing more than a large exedrae with seats, and longer by one third than its width. On the right, in the coriceum, immediately adjoining which is the conisterium, near which, in the angle of the portico, is the cold bath, which the Greeks call λουτρον (loutron)."

He then gives technical explanation of the location and construction of the frigidarium (cold room) and the sudatorium (sweating room) and the hot bath, and continues speaking of porticos, which are to be "so formed that as well on the side next the wall as on that where the columns stand, there are margins for paths of not less than ten feet; the center part is sunk one foot and a half from the path, to which there is an ascent of two steps; the sunken part is not to be less than twelve feet in width. Thus those

who in their clothing walk around the paths will not be incommoded by the annointed wrestlers who are practicing."

The learned Becker thus takes his imaginary Charicles to a gymnasium :

He found the gymnasium very full of company. In the arcades surrounding the peristyle were groups of men, young and old, engaged in discourse of various kinds. Here a sophist, seated amidst his scholars, was discussing by the method of interrogation the pros and cons of some doctrine of ethics. The large semi-circular bench of marble on which he sat could only accommodate half his auditory, so the others stood in front to catch the wisdom that proceeded from his mouth. Here a rhetorician was making a critical examination of a speech elaborated by one of his pupils. In several places little knots had formed, and were talking of the important occurrences in Asia. News had just arrived from the Macedonian host, announcing the continuance of the siege of Tyre, and some assayed a display of their topographical acquirements by drawing in the sand with their sticks a plan of the city and its position. In the great court many were engaged in all kinds of exercises, while others were already hurrying to warm or cold baths, or annointing their limbs with pure oil in the Elæothesion.

Charicles strode through the Palæstra to the exercise grounds in the open air. Here were several running races, amid loud acclamations of the beholders, who encouraged first one, then another; others stood ready to jump, with the leaping weights in their hands.

And then Charicles, with his friend Ctesiphon, engaged in a wrestling match, and then went to the bath. Charicles' father, we are told, "was averse to the one-sided exertions of the athlete, yet a sensible course of gymnastics, as well as chariot driving, and the chase, together with the intercourse of learned men, ranked with him as the only occupation befitting a free-born youth."

The Greeks, however, found that the ordinary training in the gymnasia was not sufficient to enable the pupil to win prizes at the festivals where the great national games were celebrated, and a severer course of training was instituted in the palæstra for certain of those who gave their lives to their calling.

They were called athlete (athletes), and they were the first professionals, for their whole business was to win the prizes at the Isthmian, Nemean, Olympian and Pythian games. Great was the attention bestowed upon the athlete. The gymnasiarch superintended their exercises in person, and their diet was carefully regulated by the Aliptes. The fact that the "agonistes," or amateurs, could never win as against the professional athlete gradually resulted in the overthrow of the whole system. The importation of the athlete to Rome took place in B.C. 186, and they gradually acquired greater and greater privileges. Professionalism, now rightly considered as an obstruction in the path of true physical education, is therefore of very ancient lineage. It is not surprising that when the professionals had absorbed all the honors of the game, we find that the pendulum of public opinion swung away

from enforced exercise, and away from the gymnasium.

THE MIDDLE AGES.

In the mediæval times the golden days of the Grecian Gymnasium seemed past beyond recall, for the age was essentially military, and learning was relegated to the cloister. Travel and the tourney were the essentials. The well-known passage in the "Two Gentlemen of Verona," wherein Panthino discourses of Proteus' education, gives the view taken of the matter:

"He wondered that your lordship would suffer him to spend his youth at home,
While other men of slender reputation, put forth their sons to seek preferment out.
Some to the wars to try their fortune there;
Some to discover islands far away; some to the studious Universities.
For any or all these exercises, he said that Proteus your son was meet,
And did request me to importune you to let him spend his time no more at home,
Which would be great impeachment to his age, in having known no travel in his youth."

Thus Antonio:

"Nor needst thou much importune me to that Whereon this month I have been hammering.
I have considered well his loss of time,
And how he cannot be a perfect man,
Not being tried and tutored in the world.
Experience is by industry achieved,
And perfected by the swift course of time.
Then tell me, whither had I best send him?"

Panthino then informs Antonio that the Emperor is at court, and says:

"'Twere good, I think, your lordship sent him thither.
There shall he practice tilts and tournaments,
Hear sweet discourse, converse with noblemen,
And be in eye of every exercise,
Worthy his youth and nobleness of birth."

When Hamlet wished his mother, the Queen, and his uncle, to conclude that he was really insane, he could think of no surer way to impress that conclusion upon them, than by telling Guildenstern that he had "lost his mirth," and "had foregone all custom of exercise"—and King John spoke in hypocritical commiseration of Prince Arthur's lack, while in prison, of the "rich advantage of good exercise."

"There are," says Hallam, "three powerful spirits which have from time to time moved over the face of the waters, and given a predominant impulse to the moral sentiments and energies of mankind. These are the spirits of liberty, religion, and of honor. It was the principal business of chivalry to animate and cherish the last of these three, and whatever high, magnanimous energy the love of liberty or religious zeal has ever imparted, was equaled by the exquisite sense of honor which this institution preserved."

The education of the mediæval knights commenced at the age of 7 years. They were brought up in the castle, and there learned discipline and

the use of arms. Up to the age of 14 they were pages, and accompanied the superior lord in that capacity. At the age of 14 they bore the title of esquire, and then began in earnest the systematic exercises in horsemanship, and feats of strength and activity. According to Joinville, the youths "thus placed in the centre of all that could awaken their imagination, the creed of chivalrous gallantry, superstition, or honor must have made indelible impressions. Panting for the glory which neither their strength nor the established rules permitted them to anticipate, the young scions of chivalry attended their masters to the tournament, and even to the battle, and riveted, with a sigh, the armor they were forbidden to wear." (Hallam.) The state of learning had gradually declined in Europe from about the sixth century. Tournaments were instituted about the middle of the eleventh century, and we find that their original purpose was to encourage the development of high physical courage and activity. The tournament was the legitimate successor of the Grecian games, and gradually became celebrated with every degree of splendor. The ruler of the realm, whoever he might be, not seldom acted as the master of ceremonies, and often participated in the struggle. The victor was crowned amidst the plaudits of the assemblage, he received the prize at the hands of his lady, while the triumphant notes of the minstrels filled the air. Around him were gathered his companions in arms, with nodding plumes and glittering armor, grooms with gaily caparisoned horses, and men-at-arms with waving banners. No scene so soul-inspiring, no tableau more impressive. Is it any wonder that the age of chivalry lasted so long?

With the revival of learning, there was poured upon the knights a fervent flood of ridicule, doubtless on account of the exclusive privileges of the class, not less than on account of their general ignorance. No one has ever charged the mediæval knights with having a superabundance of learning—Charlemagne himself learned to write late in life—and when knighthood lent itself to vagrancy under the name of "knight-errantry," enfeebled by the general changes going on in European warfare, it finally fell an easy victim to the pen of Cervantes.

MODERN PHYSICAL TRAINING.

At the beginning of this century, efforts were more or less successfully made, in various countries, to introduce gymnastic exercises into the primary schools and into the family. Among those active in this work was the famous Swedish *savant*, Ling. Ling considered man as a dual being, where the soul and the body were mutually reactive according to the diversity of their nature, and he sought to harmonize human existence according to this duality. He conceived

system of physiological exercise which exercised both mind and body, and to this general theory of Ling may be traced the so-called Swedish system, which has been so popular and useful.

In France, and indeed in Europe throughout, gymnastics have been well taught in the military schools, but only recently systematic instruction for civilians has been advocated.

Physical training in England has never died out since the age of chivalry, but on the Continent, at the end of the last century, it had reached a low estate; particularly in Germany, where there was a marked physical degeneration of the people; a degeneration as marked as in America to-day. Napoleon practically ruled Europe, and back of the German Turners' organization was the firm determination to secure a regenerated country. The theories of Father Jahn were preceded by Montaigne and Rousseau in France, Campe, Salzman, Basedow and Guts Muths in Germany, Pestalozzi in Italy, and Fellenberg of Prussia; but the Germans only seem to have given practical direction to their faith. Fellenberg added military drill to instruction in gymnastics and handicrafts. (Hartwell.) Guts Muths was a pupil of Salzman at Schaepkenthal, near Gotha, where he had a small gymnasium; the gymnasium was based on the Greek model. Guts Muths became an instructor there, and taught until his death in 1839. Guts Muths wrote the Prussian Minister, Massow, urging the introduction of physical education into the schools, as the best means of reviving the military spirit of the people, but the war soon coming on again, the matter was suspended.

Frederick Ludwig Jahn was born August 11, 1778, and the present high development of physical education in Germany is due to "Father" Jahn. Indeed, it is questionable if the present revival of interest in America is not principally due to the establishment of the American turn societies. Father Jahn's idea was founded in the purest patriotism, and his book on German Nationalism, in 1810, was speedily followed by the founding of the "German Confederacy" in Berlin, November 14, 1810. It was a great undertaking to make a union of the German States, and at the same time to work out the problem of the physical regeneration of the people. Under his active efforts, "turnplaces" soon became the fashion throughout Germany, and in a few years every city of importance had its turnplace. In 1816, turn-schools for girls were permitted in Prussia, and Jahn published his work, the "German Turn Art." But the turners were growing too strong, and as courage is the expression of conscious strength, some of the turners were too bold in their political sentiments, and in consequence, an official war was declared against them, and in 1818 the turnplaces in Breslau and Liegnitz were closed, and in July, 1819, Jahn himself

was arrested as a "demagogue" and brought to Spandau. The turnplaces were for a short time placed under police inspection, but on the 2d of January, 1820, turning was forbidden throughout Prussia. In May of that year, Father Jahn was released from rigorous confinement, but was restricted to the limits of the fortress of Collberg. Jahn's friends were powerful enough to finally secure him a trial, and on December 12, 1825, he was acquitted by the Supreme Court, at Frankfurt-on-the-Oder, but the ministry still pursued him. He was put under bonds, and was forbidden to settle in Berlin or within ten miles of its limits. October 14, 1833, Bavaria had many turnplaces, and a ministerial order announced that "Turn-verein have been established, songs of liberty are being sung; this is very dangerous. Teachers beware." In 1837, turning was again allowed in the Prussian gymnasiums, and in 1840 Jahn was unconditionally released, and just before Christmas he received from King Frederick IV the Order of the Iron Cross of the second class. The turn schools grew and grew, until so well established in popular favor that, by a ministerial decree of January 7, 1844, obligatory turning was introduced into the common schools of Prussia. Two years later, turn schools for females were ordered to be established. The skies seemed bright for the followers of Jahn, but there was the "little cloud no larger than a man's hand" in the horizon. The Frankfurt turn verein was closed by order of January 4, 1848, as alleged, on account of its tendency towards republicanism, and the ministry, with evident purpose of controlling the turners, erected a central school for Turn teachers, at Berlin. But there had already been conflicts of the Kiel students, near Bau, and in Hanau, the German social democratic turn-bund had been founded on the second turnday of the first turn assembly. But the precipitation of the Revolution of 1848 resulted in the exile of many of the leading turners, their emigration to America, and the foundation of turn societies in Cincinnati and New York in the same year. In 1849, the Philadelphia Turn Society was founded, and the societies at St. Louis, Boston, Louisville and Williamsburgh. Later in the year, the American Turner-bund was founded—the avowed object of the "bund" or confederacy being not only the promotion of corporal exercises known as turning, but the promotion of liberty, the welfare and education of all classes, and the extension of turners' societies. That this first turner-bund sympathized heart and soul with the Prussian revolutionists is evident from the fact, that the German women of Cincinnati made a black, red and yellow banner, to be given to the first German State that would be declared a Republic, but the banner was finally committed to the custody of the Cincinnati turn society. October 25,

1852, the "turn father," Frederick Ludwig Jahn, died, at the advanced age of 74, having lived to see the great advance in gymnastic exercises, and having a clear perception of the coming glories of his Fatherland.

With the exception of the "Know Nothing" excitement, the course of turning has run smoothly in the United States, and at this time there are more than 30,000 turners in the United States, and about 260 turn societies. Their watchword is still liberty and education for all, and although we wish they would use English as their official language, I am convinced that their influence is always for the welfare of our common country. In our civil war, the German turners stood solidly for the Union flag, and their valor was attested on many a well fought field. On January 1, 1861, the St. Louis Turners resolved to found a military organization "for the protection of union and liberty," and a week later the Washington Turners organized a shooter's section to help defend the Capital against the secessionists, and the St. Louis, Cincinnati and New York Turn societies were nearly all sworn in the United States service on the first call for troops.² We who reap the benefits of the patriotic ardor of 1861, should not give scanty praise to these stalwart men—they deserve our warmest thanks and commendation. Their courage and valor is well shown by the New York Turner regiment, which marched out of that city in 1861, fully 1,200 strong, and when it returned there were only 460 left; more than half the number were killed in battle, perished as prisoners of war, or victims of the deadly malarial emanations from the Southern swamps. The historic volley fired by the Ninth Ohio (turner's) regiment, at Mill Springs, Ky., January 20, 1862, inaugurated the first victory of our western armies, and laid the foundation of the fame of General George H. Thomas.

But while turning affords our fellow-citizens of German nativity healthful amusement, and inspires them with principles of liberty and patriotism, it is by means of similar organizations, that the native element must keep its place, and perform its duty. It is at this time a patriotic duty to form gymnastic schools and athletic clubs, and by all means at our command stay the tide of physical degeneration that is destroying American manhood and womanhood.

The great colleges are doing their utmost; gymnasia are being equipped everywhere, and youths leaving college may now find in nearly every city a well furnished athletic club.

I fully agree with a recent editorial in *Outing*, to the effect that our modern athletic club houses combine all that is best in the Greek gymnasia with the more luxurious fashions of the Romans,

and that, owing to the exigencies of our climate, we must have houses. The Greek simplicity of costume is neither adapted to our fierce summer heat, with sudden changes of temperature, nor to the winter blasts, that come from our north-western prairies.

Much might be done by hardening from constant exposure, as all history tells us.

When a certain king waged war on the Scythians in midwinter, he found members of their hardy warriors almost naked.

"How can you withstand this bitter cold without clothing?" asked the king of a captive.

"Why do you not cover your face?" replied the Scythian.

"My face is not accustomed to be covered; the skin is hardened," good-humoredly answered the king.

"Sire, we are all face," said the Scythian.

The hardening process we may then admit as possible, but is the game worth the candle? The æsthetic fever is upon us, and let us stick to our houses, and build them as fine as we conveniently can. Let us extract all the dulcet liquid from the orange while it is still juicy, and have some pleasure in life while growing in strength and brawn.

But what are we doing for the young children? A few western cities, under the directly stimulating examples of the turners and the athletic clubs, have begun to establish gymnasia in connection with the regular instruction of the school, and paid teachers of gymnastics have begun to be employed, notably at Chicago and Kansas City; but the melancholy fact remains that the majority of our primary schools are absolutely without any provision for the most elementary physical training. The primary school should be the place where the body is made to grow straight, where all the muscles are exercised properly, and where the young, tender brain is nourished by blood made healthy through active circulation. The colleges are doing good work with the youths and young women, and the clubs and turn societies maintain and keep up the physical standard thus acquired, but the college instructors should have youths sent them with some sort of preliminary physical training. At the preparatory school he begins his classics, his mathematics and physics. Why should he not also begin his physical training at the preparatory? Not only would the results be more perfect when thus commenced, but when we remember that the majority of our youth do not enter college at all, we then realize that unless the primary school be made the place of beginning, the work is never commenced.

When one sees the sickly, stoop-shouldered, knock-kneed, feeble children attempting to become educated men and women, there is no longer reason to wonder at the marvellous in-

² Among the German Turners' regiments may be mentioned the Ninth Ohio, Thirty-second Indiana, Twenty-fourth Illinois (Hecker's), and the First, Second, Third and Fourth Missouri. Milwaukee also sent a turn regiment.

crease of our insane. Every State in our Union has to annually increase the accommodations for the insane, and if this necessity were confined to those States where the population increased with equal pace, it could be accounted for; but we see those States in which there is no increase of population year after year adding to the insane class. This is largely the result of physical degeneration, as shown in flabby muscles, disinclination to exercise, and unhealthy blood. We want no *class* improvement, but we want universal attention to physical training from childhood to adult life; and until the State governments take up the matter as a patriotic duty, we must encourage private gymnasia.

The physical retrograde condition of our native stock cannot be corrected by encouragement of professional athletes. It is well to have a Sullivan to show what may be done by one-sided cultivation, as a specimen of magnificent muscle; a Winship to teach us the physical fact that a man's lifting power can be increased to an almost incredible degree; but these are not the kind of specimens after which to fashion a race. Let us have the highest types of beauty, deftness and strength, combined with mental vigor and chivalrous virtue. Let us have women like her of whom the poet said, "Grace was in all her steps, heaven in her eye; in every gesture dignity and love." And let us have strong men. Let the medical students of this college set the example. Your strong, healthy, vigorous man is never irritable, never "nervous;" he is generous, and he sleeps at night. He is worth something to his country and to all mankind. He exercises his muscles, the blood flows freely in his veins, he is hungry, he digests his food, his brain is nourished, and his mental faculties are active. He lives, and the world is better because he lives. I love to look at a bright, happy-faced man, who takes a full breath and expands his chest; who looks at the rising sun without blinking, and whose face glows with the animation lent it by a pure soul, unvexed by an irritable body. Think what glorious soldiers a regiment of such men would make! How the arts and sciences would flourish under the general stimulus of strong America! Our beloved country would indeed become blessed. Our new America, strengthened by exercise, made happy by good health, might easily outshine the glories of the golden age of Greece, and, "like precious stone set in silver sea," flash its beauty to the sun.

DR. FREIDRICH SCHANTA, of the University of Prague, succeeds Prof. Carl Braun in the chair of Midwifery in Vienna. He is the author of a manual of operative midwifery and numerous lesser works.

SOCIETY PROCEEDINGS.

CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS.

The Second Triennial Meeting of the Congress of American Physicians and Surgeons held in Washington, September 22, 23, 24, and 25, 1891.

General Session.

TUESDAY—FIRST DAY.

The Congress was called to order by the chairman of the Executive Committee, DR. WILLIAM PEPPER, who introduced the president, DR. S. WIER MITCHELL, of Philadelphia.

The first scientific matter brought before the session was the discussion on

CONDITIONS UNDERLYING THE INFECTION OF WOUNDS,

Including a Discussion of Disinfection with Reference to Treatment of Wounds, of the Relation of Bacteria to Suppuration, of the Resistance of Tissues to the Multiplication of Bacteria, and of the Effects of Antiseptic Agents on Wounds.

The discussion was opened by

DR. WILLIAM H. WELCH, Baltimore, Md. That the presence of certain kind of bacteria is an essential condition of wound infection is so well established that discussion of this point is not likely to arise. The comparatively simple conception that a wound to which bacteria gain access, necessarily becomes infected, has been greatly modified. The traumatic infection present their own peculiar problem. The doctrine of wound infection involves the consideration of many varying and often complicated factors relating both to the agents of infection and to the individual exposed to the infection.

The subject was considered under the following heads:

1. What are the microorganisms concerned in the infection of wounds, and how do they act?
2. How are we to explain the great differences in the effects produced by the pyogenic micrococci; their apparent harmlessness under some conditions, their fatal influence in others.
3. What are the ways by which bacteria gain access to the wound?
4. How often are bacteria to be found in wounds treated antiseptically or aseptically. What are the character of these bacteria and where do they come from?
5. What are the best means of surgical disinfection?

The observations as to the relative frequency of the ordinary pyogenic staphylococci and streptococci are not altogether concordant. The yellow staphylococcus appears to be more common in furuncles and abscesses than the white staphylococcus.

The author had found a white staphylococcus in small stitch abscesses and minor grades of inflammatory disturbance in wounds treated antiseptically and aseptically which differs in certain particulars from the staphylococcus pyogenes albus. He suggested that it be called the staphylococcus epidermidis albus. The efforts to differentiate into distinct species the pathogenic streptococci have met with little success. The list of bacilli which may be concerned in suppurative and other inflammatory affections is much longer than was formerly supposed. The bacillus *coi communis* was referred to. The chief interests of the observations being that they furnish an illustration of the possible predisposition to infection afforded by intestinal lesions, and also give an example of the much disputed autoinfection of the suppurative inflammations examined bacteriologically with negative results.

There is reason to suppose that the process of suppuration serves a useful purpose and is one of the most efficient weapons employed by Nature in combating invading microorganisms. Exactly how the abscess formation checks the invasion of bacteria, we do not know.

The quantity of a culture of the staphylococcus aureus required to produce suppuration is not the same for all tissues and all parts of the body. There are also variations in virulence of different cultures of the pyogenic cocci. Inasmuch as it is by their toxic products that the pyogenic bacteria do injury, it is not surprising to find that it makes a great difference in the result whether or not these bacteria enter the tissues already equipped with a reserve force of this poisonous material, or whether it must begin the fight unarmed. This matter of accompanying toxins is possibly of great importance in our understanding of the potentialities of the living agents of wound infection. The differences in virulence found to exist between inflammatory exudates from various sources are much greater than those observed in the cultures of the same bacteria on artificial media.

In regard to the conditions in or about a wound which favor the lodgment and development of pyogenic bacteria, it may be said that anything which interferes with the integrity of the living tissues in a wound is a predisposing cause of suppuration. Chemical irritants, such as carbolic acid and corrosive sublimate, favor the development of microorganisms. A solution of corrosive sublimate as weak as one to two thousand is followed by a distinct line of superficial necrosis. We are not so well informed as to the influence exerted by blood in a wound. Most surgeons lay great stress on hemostasis in surgical operation, while others advise that in certain classes of cases the wound be permitted to fill with blood clot. Is this a source of danger? Fresh blood serum does not possess any such

germicidal power over the pyogenic cocci as it does over the typhoid and many other bacteria. The power of the living tissues to overcome a certain number of pyogenic bacteria is well recognized, and the tendency of modern surgeons is to respect those tissues more and more, not to destroy their vital capacities by the unnecessary application of strong chemical disinfectants, not to bruise them, not to make them too terse, not to strangle them, not to suffer the presence in wounds of spaces and foreign bodies which remove bacteria from the influence of the living fluids and tissues.

Of the various ways in which pathogenic bacteria gain access to wounds, that by contact with infected hands, instruments and other objects, offers the greatest danger. The possibility of infection from the air cannot be ignored. Even in wounds treated aseptically or antiseptically it is not uncommon to find bacteria. The skin may have all sorts of bacteria upon it, but in addition it has its own distinctive bacteria. After the skin has been thoroughly washed and scrubbed the prevailing organism will be found to be the white staphylococcus. This is often found in parts of the epidermis deeper than can be reached by any known means of skin disinfection. We can now understand how, without any flaw in the antiseptic technique of the surgeon, this microorganism may be found present in wounds, and we have here an explanation of the frequent occurrence of stitch abscesses, although the inference should not be drawn that the white staphylococcus is the only bacterium concerned in the production of these annoying complications. How much practical importance attaches to the demonstration of this coccus the author was not prepared to say. The surgeon with good technique who does not bother himself about this coccus in the deeper layers of the skin, is not likely to be severely punished by the behavior of his wounds. Those who put in drainage tubes and other extraneous substances will have to consider it. Some surgeons, on the basis of researches on the bacteria of the skin, have abandoned skin sutures, the edges of the wound being brought together by subcutaneous sutures.

In regard to the methods of surgical antiseptics it was said that the conditions for efficient chemical disinfection have been found to be far more complicated than was formerly supposed, and the substitution wherever applicable of the simple and certain methods of disinfection by heat is to be commended. Chemical disinfectants still have their place for many purposes in the operating room, but their place is not in healthy wounds. Thorough scrubbing of the skin with soap and water by a sterilized brush removes many of the bacteria, but not all, and cannot be regarded as satisfactory means of cutaneous disinfection. Corrosive sublimate accomplishes

much less than is generally supposed. The best results obtained have been by a method in which a saturated warm solution of permanganate of potassium, followed by a similar solution of oxalic acid, plays the principal disinfectant rôle, and this is the procedure now adopted in the gynecological and surgical wards of the Johns Hopkins Hospital.

Dr. ROSWELL PARK, of Buffalo, N. Y.

The study of wound infection is inseparable from that of immunity, and when we have learned what which constitutes or favors immunity we shall approach nearer that which is now a terra incognita. Immunity is a complex condition not dependent upon any single factor, and from pathological interest as well as from clinical importance, our endeavor now must be to analyze the main question of what constitutes or confers immunity, and try to recognize and then solve its various subordinate queries. This statement, too, is inseparable from another, which is to the effect that the surgery of to-day should aim to be aseptic, and not merely antiseptic. In other words, we should abolish sepsis, and not merely aim to antidote it or conquer it when present. The condition of sepsis is a complicated one, consisting of a poisoning by ptomaines, toxins and albumoses having widely different properties. Some of these substances are so antagonistic that one may neutralize the other. In the intestinal canal there are produced poisonous substances which are taken up by the absorbents, but then are filtered out by the liver before reaching the systemic circulation. It is by virtue of this depurative action of the liver that many cases of septical intoxication in surgical patients are avoided. In a division of the general subject of blood poisoning, a condition which may be called intestinal toxæmia or entero-sepsis deserves a distinct place. This occurs not infrequently and may merge into a condition of sapræmia or septicæmia; but, if promptly checked, there is a speedy return to a desirable condition both of wound and patient. . . . By no means do all cases of surgical sepsis have their origin in or about the wound.

We have learned a little in reference to the antagonism of different bacteria and the poisons which they produce. A microbe may enter the system and produce a proteid or albuminose poisonous to the animal, while the introduction of some other substance may neutralize this poison and save the animal. The principle is the same whether the antidotal poison be injected as such, or a second species be inoculated by which it may be produced. Brunton has suggested that blisters do good in this way, by an endermic administration of proteids derived from the blood, but unaltered in their passage from the vessels as to have a different effect, and probably by their chemotactic properties. He also suggests that

bleeding may act in a similar manner, as it has been shown that the abstraction of venous blood causes an absorption of proteid matters from the tissues, and these may have an action of their own on the tissues with which they come in contact. The benefits of free purgation probably find here their proper explanation.

The term chemotaxis, to which reference has been made, relates to that faculty possessed by all motile bacteria of moving towards or away from certain substances which seem to attract or repel them. The same power is inherent in the plasmodia of maxomycetes, as well as in various other unicellular organisms; and leucocytes, if not other cells of the human body, possess the same property. Chemotaxis is spoken of as positive or negative, as there appears to be attraction or repulsion. Among the most actively positive chemotactic substances are cultures of bacteria. These are powerfully attracted by the leucocytes. The effect is the same, whether the cultures are alive or have been killed by bottling. The active agent is some product of the life and growth of the bacteria. The leucocytes thus attracted act as scavengers for the surrounding tissue.

These facts have an important bearing upon questions which vitally concern the surgeon. In the light of these researches, it is difficult to see how the possibility of phagocytosis can be denied, and the impossibility of this process looms up in a flood of light when one discusses the phenomena of suppuration or of other kinds of infection, as well as of recovery or immunity therefrom. Support of the phagocyte theory has come from the work of Hankin on "Defensive Proteids." From the spleens and livers of various animals he has isolated the proteid, which has the power of killing bacteria, and he has found that this, while absent from normal blood, could be obtained from the blood of fibrine animals.

The separation of dead and dying matter is a process in which the formation of proteid material figures largely. An important bearing of these facts is on the use of so-called antiseptic agents. The ideal antiseptic is probably blood serum, its parasiticide properties being, in all probability, connected with the existence in it of a globulin which is soluble only in a weak solution of common salt. This may explain the well-known antiseptic action of common salt.

It has been stated that by no means all the sources of sepsis concern the wound itself. The other principal sources of infection may be classified as follows:

1. Previous long-existent toxæmia, as syphilis, diabetes, acetohæmia, lithæmia, alcoholism, malaria.
2. Previous anatomical changes which reduce vitality, as inherited diatheses, old age, amyloid change, chronic and acute nephritis.

3. Recent or acute toxæmia, as uræmia, typhoid, intestinal toxæmia, sterconal toxæmia.

4. Other acute conditions, as starvation, scurvy, anæmia.

5. Conditions of environment, as bad hygienic surroundings.

6. Effect of anæsthetics.

7. Effect of antiseptics.

Antiseptics may favor infection in more than one way. Mercurial and iodoform poisoning are not uncommon. When this is established, the case becomes one of acute toxæmia. The wounds may fail to unite, and suppuration may occur again, or the chemical reaction between the vital fluid and the antiseptic may cause a loss of the properties of the antiseptic agent, while the tissues on which it acts may have their constitution so changed as to favor rather than resist infection. Investigations make it appear best to keep all antiseptic agents away from absolutely clean, fresh surfaces. The value of blood serum as an antiseptic has been abundantly shown. This will be poured out in quantity sufficient to serve not only as a cohesive, but as an antiseptic agent. The question here arises as to what is the best antiseptic. It would appear that for most purposes peroxide of hydrogen is the ideal antiseptic, as it not only merely destroys living organisms, but by oxidation of undesirable and infected material, acts as a scavenger of the tissues. We, however, have yet to learn how to utilize to the fullest advantage the properties of blood serum.

Direct infection may be of two varieties, self- or auto-infection, and contact infection. The principle sources of contact infection are as follows: 1. Skin and hair. 2. Instruments. 3. Sponges or their substitutes. 4. Suture materials. 5. The hands of the surgeon and his assistants. 6. Drainage material. 7. Dressing material; and 8, Miscellaneous, *e. g.*, drops of perspiration, an unclean irrigator nozzle, the nail brush, the clothing of the operator or bystanders, etc.

The best plan of sterilizing the skin is shaving, followed for a day or two, if there is time, by some antiseptic ointment, properly prepared. The skin should then be washed with *sapo viride* of the German pharmacopœia, with five per cent. of lysol or hydro-naphthol. Then there should be worn until the time of operation a compress, wet with some liquid non irritating antiseptic, such as creolin or lysol (five per cent.), or hydro-naphthol in saturated cold aqueous solution. At the time of operation there should be a final scrubbing with hydro-naphthol soap, with shaving, and then the skin washed with equal parts of alcohol and ether, or alcohol and turpentine. Where there is not time for this, we must content ourselves with the thorough use of the nail brush, the razor and antiseptic

soap, with the subsequent use of alcohol and ether.

Instruments are best prepared by dry sterilization, as this injured them less than other plans.

In regard to sponges, there is nothing to be added to the well-known directions. It would seem better to use some cheap absorbent material which, after use, could be thrown away.

Silk is best sterilized by placing it in a test tube, then plugging, and keeping for an hour in a steam sterilizer upon two different occasions. Silk-worm gut may be prepared by immersion for a few hours in a one-per-cent. aqueous solution of corrosive sublimate, and then preserving in alcohol. Catgut is best prepared by immersion in benzine or ether to remove fat. It is then dried and soaked for one or two days in a one per cent. watery solution of corrosive sublimate, after which it is dried and transferred to oil of juniper berries, and from this to strong alcohol containing one permille of sublimate. In this, if desired, it can be boiled. It may be chromicised before putting in the oil of juniper.

The hands, even after having been in contact with septic matter, may be sterilized by the following method: Wash with soap and water, using nail brush. Then wash the hands and arms with flour of mustard, as though it were powdered soap. This will remove all odor. Then wash with *sapo viride* (G. P.), to which has been added five per cent. of lysol, creolin or hydro-naphthol. Then rinse, and immerse in a strongly colored solution of permanganate of potassium. They are then rinsed and immersed in a solution of oxalic acid sufficiently strong to decolorize the skin in two or three minutes. The oxalic acid is rinsed off, and the hands may be considered aseptic.

Drainage is probably required only in septic or infected cases.

After an ideal aseptic operation, we need only a sterilized and a protective dressing. In some cases there may be advantage in impregnating the dressing with some antiseptic.

Among miscellaneous sources of infection may be mentioned the use of an unguent applied to the skin to prevent the adhesion of dressings. Experiments have shown that ointments made with even ten per cent. of resorcin or naphthalin, without the application of heat, contain bacteria. The same ointments, heated to the temperature of boiling water, seem to be sterile, and to suffer only from air contamination.

DR. PARK presented the following conclusions:

1. Study of wound infection and of the septic condition thereby produced is inseparable from a study of what constitutes immunity.

2. By a study of immunity is furnished the best clue to a due appreciation of the principles of asepsis.

3. The surgery of the future must aim to be

aseptic, for so far as fresh cases are concerned, we have passed the merely antiseptic era.

4. Asepsis is to be achieved not alone by attention to the wound and the paraphernalia of operation, but by the closest regard to the condition of the patient's organs and tissues.

5. Sepsis may arise from circumstances and conditions other than those pertaining to the wound itself, although hitherto, practitioners have been too prone to scan solely this field when searching for its cause.

6. Sepsis and infection are combatted in more than one way by natural agencies and by inherent properties of cells and fluids totally aside from the measures which the surgeon institutes, and the wisest man is he who studies to take advantage of these vital activities rather than introduce new and conflicting elements from without.

7. A recognition of the power of chemotaxis possessed by organized and unorganized materials in such varying degree can be utilized to great advantage so soon as it can be reasonably clearly defined.

8. A study of chemotactic activity appears to impress one with the truth of the phagocyte doctrine, which if proven, is one having a large bearing upon the principles as well as the practice of the surgery of the future.

9. The proteid material contained within cellular infectious organisms both plays such a rôle in causing chemotaxis as well as in poisoning the animal infected, that we have reason to eagerly welcome all knowledge concerning it.

10. So fast as such proteid material can be isolated, we need among other things to study its effect upon the commonly used antiseptic agents.

11. We need to study much further the antitoxic and bactericidal properties of human blood serum, and the means by which we can avail ourselves of the same.

12. Some such classification as I have attempted to give of the various causes of lowered resistance to infection, or of the causes of vulnerability or susceptibility, will certainly assist in a due appreciation thereof, and will often aid in so fortifying the patient that he may resist infection to which he would otherwise succumb.

13. The condition of enterosepsis, fæcal toxæmia, stercoreal intoxication or whatever it may be called, is certainly one which every practitioner has to fear and against which he should assiduously guard. It is not sufficiently generally recognized and combatted.

14. A sub-form of this condition might justly be made and entitled gastro-sepsis, comprising cases where defective stomach digestion often from dilation, brings about a lithæmic or other toxæmic condition which favors infection.

15. Antiseptic agents in the past have worked a revolution in surgical practice and results. We

have now reached a time when we know that they all have their disadvantages and also understand how, if we are strictly antiseptic in our work, we can afford to discontinue their application to wound surfaces.

16. But the insurance of aseptic character of such work, necessitates the use of antiseptic agents of some kind upon everything which may directly or indirectly come in contact with these surfaces.

17. When this work is strictly aseptically performed, the use of drains or further employment of antiseptics, is either an expression of mental uncertainty or of fear. It may be in the interest of humanity, undoubtedly it often is, but it is not attaining the ideal of scientific work.

DR. ARTHUR T. CABOT, of Boston, referred to the debt which practical surgeons owed to the scientific workers. It is the knowledge of how to obtain aseptic wounds that has revolutionized surgery. Reference was next made to the phagocytic action of the cells, and to the germicidal action of the blood serum. The only question is as to which of these processes is distinctly destructive. The bactericidal action of the blood serum has been proved. These observations may serve to explain some of the phenomena in wound fevers. It may be that in erysipelas, the irritation set up by the application of blisters, iodine, etc., may serve to limit the spread of the disease by the action of the blood serum on the micrococci of the disease.

In treatment of wounds, it is desirable to avoid placing animal sutures in the wound. It is better to close all spaces in the wound by pressure. He had found by culture experiments that where the skin, prior to the operation, was free from organisms, yet at the close of the operation their presence could be demonstrated, showing that bacteria had been sown on the wound by the air or otherwise. If necrotic tissue or animal sutures be present, they might constitute a nidus for the development of the bacteria.

MR. THOMAS BRYANT, of London, said that if bacteria are the seed, we must remember that the soil is not of less importance. If the soil is not suitable for the growth of the seed, it will not grow. No surgeon would operate on a patient, except in a case of urgency, until the subject had been prepared for operation. In order to prevent the entrance of the germs, irrigation is of service. For this purpose iodine water, made by adding a few drops of the tincture or solution of iodine to water, is the most valuable. This may be made of a light cherry hue for clean wounds, and of a dark cherry for dirty wounds. It also acts as a good styptic. As a dressing he uses wood wool. The wound is dusted with iodo, 1 part to 1 to 5 parts of boracic acid. In every operation there is a certain amount of molecular death, and drainage is required for thirty-six

hours. Pressure is better than deep sutures for bringing the deeper parts of the wound in contact.

DR. HAROLD C. ERNST, of Boston: While it is true that nearly all forms of suppuration are attended by bacteria, yet it has been shown that a process answering to suppuration can be produced without the action of bacteria. The products of this suppuration, however, do not produce activity when introduced into other animals. It has been shown that some of the agents used to destroy bacteria really favor their growth, by diminishing the chemotactic power of the surrounding tissue cells. Notwithstanding laboratory experiments show the possible occurrence of chemical suppuration, it still remains to be demonstrated that the infection of wounds as seen in practice occurs without the influence of bacterial activity. The most important lessons taught by investigations in this subject are those which warn us that our pupilage is not yet over, and that we are but entering upon the first stage of our knowledge of the processes spoken of here to-day.

MR. JOHN CHIENE, of Edinburgh, said that he had assisted Professor Lister during the whole of his time in Edinburgh. The longer he lived, the more he believed in the work of Lister, and the impress that he had made on surgery. He considered the bacteriological investigations as of the greatest importance, for on these the surgeon must depend in his daily work. Lister long ago spoke of the antiseptic value of the blood clot, but long before, John Hunter pointed out the value of the blood clot. The speaker considered that the spray was of great service. The term "integrity of the tissues" had been used by both speakers, but John Hunter had also laid stress on the vitality of the tissues, which he defined as "the power of the tissues to resist putrefaction." He thought that not only by improving the soil, but by destroying the plant, the best results would be attained.

DR. ARPAD GERSTER, New York, spoke of the many sources of contact infection, and referred especially to infection the result of bad habits on the part of the surgeon. The surgeon may carry out all the details of aseptic and antiseptic treatment, and yet nullify all by a habit he may have of rubbing his nose, his hair or his face; or, as the speaker had seen, placing the knife in his mouth that he might use his hand. An important point in the prevention of infection is clean dissection with the knife, without tearing or bruising the tissues. In regard to irrigation and drainage, he said that these could be eliminated only where the surgeon was absolutely certain of his asepsis, and thought it dangerous for the general practitioner to discard drainage. If he is not certain of his asepsis, he should cling to the older methods, and from these he may ascend to the highest pitch of skill when he can work with real asepsis.

WEDNESDAY, P.M.

DR. P. S. CONNER, of Cincinnati, Ohio, read a paper on

THE LATE MANIFESTATIONS OF SYPHILIS.

More than any other disease, not excepting tuberculosis or cancer, syphilis is the common meeting ground of us all, physicians, surgeons, obstetricians, specialists, pathologists, sanitarians. Modified by transmission through a dozen generations, it is still a dreadful and dreaded ill. Were there only the early lesions, syphilis would take place among the minor ills, and this is the history in the large proportion of cases. Probably in three or four out of five of the acquired cases, the disease is short lived and does but little damage. There is, however, no means of saying in any individual that in a few months or years the disease will be eliminated. Those syphilitic by inheritance suffer from late lesions in far greater ratio than the acquired cases.

There is no sharply defined line between the early and the late constitutional symptoms. Speaking generally the late lesions are neo-formative, the early hardly ever so; so that the gumma is the sign and seal of the tertiaries. Further they are not communicable. As a rule, they are quietly developed. No region or organ is exempt from invasion with resulting new growths. Of most frequent occurrence are the affections of the bones and of the nervous system. The lesion of the bone may be single or multiple. The symmetrical involvement of bones is exceptional. Liquefaction is rarely observed and suppuration only an accident. As ordinarily seen at the present day, extensively destructive and deforming bone inflammations are almost confined to the head and the nasal regions. The reason of this is probably the exposed position of the bones, the thinness of some of them, the abundance of small vessels and the intimate fusion of mucous membrane and periosteum. In the adult and acquired there is seldom difficulty in recognizing the specific character of the lesion.

Though a large proportion of chronic bone and joint disease in the child, the adolescent and the young adult is tubercular, yet the cases in which it is syphilitic are by no means few. This may be recognized by the location of the disease, by recognition of traces on the cornea, the teeth and the skin, by application of the therapeutic test and when practical, by inoculation.

The most frequent and the most dangerous lesions are those of the nervous system. Dr. Horsley in speaking of cerebral gumma, declared that "medicinal treatment in no wise cures and only very temporarily alleviates the trouble. . . . Excision offers the only chance for the patient." Is this the fact? Has not more than temporary alleviation followed the use of the iodides? However great the advances of brain

surgery in the last few years, would not the outlook of the syphilitic be worse than it is, if only in the removal of the gumma could be found a chance of recovery? The affections of motion, sensation and intellection are frequent in the order given. The first at some time and in some degree is present in every case. Hysteria may mimic syphilis. It is infrequent in men, while brain syphilis is rare in women. In brain syphilis, paralysis is more common than convulsions. Sensation frequently remains unaffected. Disturbance of intellection are almost necessarily associated with any brain lesions.

In certain cases, although rare, marked motor, sensory and intellectual disturbance occur suddenly and together. Ordinarily after sleep, the patient is found in a state of stupor, from which it is possible to rouse him partially. The muscles are relaxed. The pulse rate is decidedly lessened, the breathing is slow and the temperature is subnormal. Under mercurial treatment, promptly and persistently maintained for many months, relief even permanent may be expected and secured.

Spinal lesions are of infrequent occurrence. Exostoses of the spinal canal may occur and neoplasms develop. There may be pain and paralysis affecting different parts according to the location of the lesion. A question of much interest is the causative relation of syphilis to locomotor ataxia. That the majority of ataxics have had syphilis cannot be questioned. Tabes is certainly not of true gummatous origin, nor can the sclerosis be regarded as the result of the diffused formation so often found in the cerebro-spinal axis, as in other parts of the body. Syphilitic treatment generally fails to cure or even to retard the evolution of symptoms.

There are many things about late syphilis that deserve careful study. What is the explanation of the long years of intermission with the after development of grave functional and organic disturbance? Where has the disease been lurking all these years.

What are the relations of syphilis to other diseases and to injuries? Pre-existing tubercular disease renders probable a more severe and often a more rapid syphilitic course. To the "strumous" individual the specific infection is more dangerous than it is to others. That specific lesions may become tuberculized has been proven, but only rarely does the tubercle bacillus find a nidus in and about a syphilitic new formation. Syphilis is not likely to be inoculated on a person suffering with cancer, and if it is there is no good reason why the two diseases should not each go on in its natural way. On the other hand, cancer may and not so very rarely does attack an area in which there has long been specific thickening and induration, as in the chronic leucomata of the tongue. Once in awhile a gumma

undergoes cancerous degeneration, more often when situated in the tongue than elsewhere. The local affection, no longer amenable to specific treatment, goes on steadily from bad to worse. In certain localities, especially in the breast, a gumma may readily be mistaken for a cancer. If syphilitic growths do not become sarcomatous they often resemble carcomata, and many reported successful operations for the malignant affection has been really one in which a gumma has been removed.

As a rule the wounds of syphilitics, when the disease is in a latent stage, heal as promptly as in other cases, although union may be delayed or even prevented until after the patient has been brought under the influence of the anti-specific remedies. This is less true of wounds of the soft parts than that of the hard parts, as fractures, where at times false joints will form in spite of the most judicious treatment. When the special lesions are in the process of evolution the chances of interference with proper repair are not few, and no operation should be done at this time which can be postponed. Indeed, at any time before doing an operation, the success of which depends on primary union, it is well to keep the patient for several weeks under the influence of the iodides and mercurials. Very rarely does any wound become actually syphilitic. In one who has had the disease, although there have been no manifestations for years, any traumatism may be the starting point of extensive specific lesions.

In very many cases of aneurism under 40 years of age the lesion may be consequent on syphilis.

The mortality rate of acquired syphilis is rare. In its inherited form the disease is a very grave one. Four-fifths of the pregnancies terminate prematurely.

DR. ABNER POST, of Boston, co-referee: In speaking of syphilis, he spoke from the standpoint of the clinician and student, and not from that of the pathologist. He called especial attention to what is known as late hereditary syphilis. This relates to those who have inherited the disease, and only after a lapse of years show symptoms corresponding to the tertiary symptoms of acquired syphilis. The later forms of acquired syphilis are not necessarily a part of the case. The so-called late lesions occur much earlier in the history of the disease than we are in the habit of thinking. After the third year, the chances of a recurrence grow steadily less. As a preventive of late symptoms, early treatment by mercurials must be ranked high, but no method will allow us to promise a cure that is absolute immunity from subsequent attacks.

The different systems were taken up in order. Induration and enlargement of the lymphatic glands is one of the common symptoms of early syphilis. In late hereditary syphilis the part played by lymphatic is great.

Cutaneous lesions are second in frequency to the lesions of the nervous system in late acquired disease.

Diseases of bones were next referred to. A difference between tuberculosis and syphilis lies in the preference of syphilis for the long bones and their shafts, while tuberculosis attacks by preference such bones as those of the wrist and ankle. Disease of the joints are at times undoubtedly the result of syphilis.

Reference was next made to intestinal and gastric symptoms in syphilitics. It is fairly well established that very serious lesions of the gastro-intestinal tract may take place. As one of the possible causes of disease of the ileo-cæcal valve, syphilis must be given a certain amount of consideration.

In diseases of the nervous system there is a large field which lies practically unexplored in congenital syphilis.

An interesting question is, How much influence should a negative history have in a doubtful case? There are many cases in which the existence of syphilis is not known by the patient.

Every prognosis must be a matter of special consideration. It is the persistence of the damage, and not the specific lesions, that cause the persistence of the symptoms. There is something to be deduced in the matter of treatment. Anti-syphilitic treatment has great power over the active process of late lesions, but it is powerless to restore the tissue already destroyed. The attempt to destroy a syphilitic tertiary sore is in general futile. The late lesions of inherited syphilis are as readily controlled as those of acquired disease. The amount of iodides that may be administered is very large. In regard to treatment as an aid in retrospective disease, too much value must not be placed upon this element in doubtful cases, for mercurials and iodides do have some influence over tuberculosis.

The study of syphilitic phenomena is a necessity of medical progress. The possibility of syphilis renders uncertain the diagnosis of tuberculosis and cancer, and other malignant forms of disease. We need the most careful clinical studies; we need hospitals specially devoted to syphilis; we need to make its study obligatory.

The subject was further discussed by DR. ROBERT T. EDES, of Washington, and DR. JAMES NEVINS HYDE, of Chicago.

THURSDAY, SEPTEMBER 24.

The discussion on "Fibroid Processes (chronic interstitial inflammations, sclerosis), their Pathology, and Etiology, with especial reference to the Influence of Diathesis and Heredity," was opened by DR. A. L. LOOMIS, of New York.

Fibroid processes cannot be spoken of as degenerations, for they imply an active process, productive in character. There is always a

higher than normal grade of activity in those elements which develop connective tissue. The only way in which fibroid tissue can develop is from growing cellular elements. He excluded from the list of true fibrosis all conditions of simple preponderance of fibroid tissue from the atrophy of other elements. Two forms of fibrosis were described at length, the hyperplastic and the inflammatory. The first is due to diminished nutritive supply, to parenchymatous atrophy, to nuclear proliferation and to connective tissue hyperplasia. The inflammatory form is due to parenchymatous degeneration, to constitutional influences, and to local attraction by the products of tissue change, positive chemotaxis.

All those agencies which diminish the vital forces by which the cell appropriates to itself its proper elements, tend to the production of fibrosis. These agencies may be mechanical, chemical or mental. Among the causes of fibrosis may be mentioned direct stimulation of fibrous growth, all conditions including a limited degree of nutritive supply, all conditions and elements which induce perverted nutrition, either degeneration or necrosis, including mechanical forces, perverted or defective nutritive supply, and all toxic and trophic influences.

The relations between diathesis and fibroid processes were next considered. A diathesis may manifest itself by any bodily function displaying an activity out of proportion to the stimulant applied. In the fibroid diathesis, the growth of fibroid tissue is out of proportion to the amount of stimulation. Fibroid processes are not always injurious, as is seen in cases of cured tuberculosis. In seventy cases of cured tuberculosis under the observation of the writer, fifty-four presented well-marked evidences of fibrosis. Diathesis often determines the nature or prominent action which will follow any given irritant or stimulation, provided more than one is possible. It also modifies the ratio between the established process and its causes. The speaker next referred at length to the special manifestation of the fibroid process in the arteries, heart, kidney and liver.

DR. WILLIAM OSLER, of Baltimore, considered the fibroid processes under the head of degenerative, inflammatory and developmental. The degenerative were subdivided into the atrophic, the secondary degenerations, the toxic forms, as from lead, ergot, syphilis, the sclerosis associated with similar changes in the smaller arteries and capillaries. The degenerative form includes the greatest number.

The inflammatory form was subdivided into the secondary forms, in consequence of reactive inflammation following hæmorrhage, tumors, foreign bodies, abscess and trauma; the sclerosis which follow primary encephalitis or myelitis.

The following questions were suggested for consideration:

1. What is the relation of vascular change to the degenerative sclerosis? How far histologically are they mesodermal or ectodermal; or are they mixed, containing both neuroglial and collagenous connective tissue?

2. The lobar sclerosis of children. What is the nature of the primary affection? Is it inflammatory, an encephalitis or meningo-encephalitis; or is the essential lesion in the vessels?

3. Developmental. Can we recognize a purely ectodermal form?

DR. CHARLES L. DANA, of New York, referred to the chronic fibroid processes of the spinal cord. He classed these into, first, primary degenerative; second, secondary degenerative; and third, reparative and inflammatory. The first includes locomotor ataxia, lateral sclerosis, combined sclerosis, progressive muscular atrophy and amyotrophic sclerosis. These sclerosis are not inflammatory, but due to the destruction primarily of cells and fibres. The causes of this degeneration were either toxic substances, or disturbance of nutritive equilibrium by infections, vascular strain or imperfect nutritive supply. They are not related to any special diathesis.

The secondary fibroid processes, so-called, have been shown by French pathologists to be probably in great extent neuroglial proliferations or gliosis, not a fibrosis.

The inflammatory sclerosis, including chronic myelitis, diffused myelitis and transverse myelitis, are mixed processes composed of a simple necrotic process, inflammatory processes and secondary degenerations.

DR. WILLIAM COUNCILMAN, of Baltimore, referred to the fibroid process as found in the liver, giving the results of investigations made in the Johns Hopkins Hospital. He dwelt upon the fact that the first element in the fibroid process was a necrosis. The fibrosis is not the result of stimulation. The tendency to growth is always present, and as soon as the opposition is removed, it manifests itself.

The Congress then adjourned *sine die*.

American Surgical Association.

The twelfth annual meeting of the Association was held in Washington, D. C., September 22, 23, 24, and 25, 1891.

TUESDAY—FIRST DAY.

The Association was called to order by the president, DR. CLAUDIUS H. MASTIN, of Mobile, Ala., who delivered the presidential address.

The next paper was read by DR. D. HAYES GNEW, of Philadelphia, an abstract of which follows:

PRESENT STATUS OF BRAIN SURGERY BASED ON THE PRACTICE OF PHILADELPHIA SURGEONS.

What is the present position of brain surgery and what practical lessons can be deduced from a review of the recorded results in this department of surgery? The object of the author was not to glean the entire field but to confine himself to the work done by Philadelphia surgeons in trephining for epilepsy traumatic and Jacksonian intra-cranial abscess, hæmorrhage, hydrocephalus, cephalalgia, microcephalus and neoplasms.

Traumatic Epilepsy.—Fifty-seven cases were recorded. Of this number forty-one recovered from the operation, four died and of twelve the result is not given. Thirty-two experienced temporary relief, nine obtained no benefit, four passed out of observation and four were operated on too recently to permit of the result being determined, and four are reported cured. In one of the cases reported cured, the patient had been free from attacks for twenty-eight months. In two, for ten months, and in the fourth, a branch of the great occipital nerve was found imprisoned in the bone cicatrix. While the results in these cases have not been satisfactory, it by no means follows that surgery holds out no hope against epilepsy. It is not saying too much to assume that surgery is responsible for the great majority of traumatic epileptics, though this statement does not by any means criminate the surgeon of an early day. Whenever the profession can accept the doctrine that all depressed fractures, however slight the depression, and entirely irrespective of pressure symptoms, are proper subjects for trephining, then will traumatic epilepsy largely disappear from the list of surgical diseases. It is not improbable in view of the greatly diminished risk of trephining, that the operation will be extended even to cases of simple fracture or fissure of the skull.

Jacksonian Epilepsy.—The table contains fourteen cases. In all the discharging centre was removed. Nine recovered and four died. Of those recovering, three had less frequent and less violent attacks. One realized slight benefit; one disappeared shortly after operation, and in two no benefit was observed. One is reported as cured, and in that case the operation was done during the present year.

Abscess.—Eighteen cases of this nature have been collected. Six had had fracture of the skull; two had syphilitic necrosis. In one a foreign body had entered the brain; in nine the abscess was due to middle ear disease and in two there had been a severe blow without fracture of the skull. All the patients died within less than fourteen days.

Five cases of trephining for intra-cranial traumatic hæmorrhage are recorded. In each instance the symptoms necessitating operation developed

within twelve hours after the reception of the injury. Four of the five cases recovered not only from the operation, but with the restoration of the suspended functions.

Of trephining for acute and chronic hydrocephalus, five cases are reported. All the cases died, one living to the forty-fifth day. As hydrocephalus is usually due to tubercular disease or to morbid growth, it is difficult to understand on what ground such operations are undertaken.

Cephalalgia.—Five cases are given in each of which the focus of pain was referred to the neighborhood of a scar on the scalp. In four of the cases complete relief was afforded.

Trephining for Microcephalus.—Seven cases are reported, of which four died and three recovered from the operation. One of the deaths, however, was due to scarlet fever occurring shortly after the operation. The result in the successful cases is reported as "moderate improvement." From the results obtained from the education of idiots, the author thought it wiser to relegate these unfortunates to special training schools rather than to the trephine and rongeur. The debatable cases would be those accompanied with athetosis, in which condition some improvement might be obtained.

Brain Tumors.—Only four operations for brain tumors have been done by Philadelphia surgeons. In one the growth was a fibroma weighing four ounces. The operation was done by Dr. Keen, December 15th, 1887, since which time the patient has had only six epileptic seizures. In the second case done by the same operator the tumor was in the occipital lobe and not removable. The patient died the following day from shock and hæmorrhage. In the third case no tumor was found, and in the fourth a cyst occupying the cuneus was found and emptied. The patient died in thirty-six hours and at the autopsy a large sarcoma was found occupying the temporal sphenoidal lobe.

The deductions presented by the author are as follows:

1. That all fractures of the skull attended with depression, however slight, and entirely irrespective of symptoms, should in view of the late after effects be subjected to the trephine.

2. That trephining for traumatic epilepsy promises only palliation at best.

3. That trephining for Jacksonian epilepsy is to be regarded as only affording temporary benefit.

4. That trephining for abscess in view of the fact that all such cases left alone almost invariably terminate fatally is entirely proper, and that the earlier such operation is done the better.

5. That trephining for intracranial traumatic hæmorrhage is both an imperative and highly promising operation.

6. That, medical measures having failed, tre-

phining for cephalalgia, or traumatic epilepsy, should be undertaken with every prospect of success.

7. That trephining for hydrocephalus is a useless operation.

8. That trephining for microcephalus, independent of athetosis, confers no credit upon surgery.

9. That it is more than probable as our observations multiply, the sphere of the trephine as a preliminary for the removal of brain tumors will be lessened rather than be amplified.

DR. JOHN CHIENE, of Edinburgh, did not take the same depressing view in regard to traumatic epilepsy. He referred to three cases in which decided benefit had followed operation. He agreed fully with what had been said in regard to operation in depressed fracture whether symptoms be present. As regards methods, he spoke of simple measures for locating the fissure of Rolando. The upper extremity may be located by means of a piece of string being one-half inch behind the middle. The angle may be secured by folding a square piece of paper into four, around one of the angles. Three of these parts will give the proper angle. The purification of the scalp is a difficult matter, but may be accomplished by shaving and soaking with carbolic lotion for three days. For opening the skull he advised, as safer than the trephine, the gouge and mallet. For enlarging the opening, the gouge-forceps fill a useful purpose. For puncturing the dura and the brain, he uses a Graefe knife. Hæmorrhage from the brain may be checked by plugging with a match; bleeding from the brain, by hot water. Stress was laid upon the necessity of constant watching of brain cases, and illustrative cases cited. In one case of supposed injury to the head (but which later proved to be a case of apoplexy), in which the patient was in a dying condition, great improvement, eventuating in practical recovery, followed trephining.

DR. W. W. KEEN held that every case of depressed fracture should be operated upon, even in young children. A blow upon the head not sufficient to cause fracture may produce laceration of the dura or of the cortex. In regard to linear fracture, however, he was disposed not to accept the view that operation should be performed. In regard to tapping of the ventricles, he thought that further experience and an improved technique would lead to better results. In epilepsy he suggested the use of the bromides after operation had been done. In many cases of brain tumor, where there is no hope of removing the growth, great comfort may be afforded the patient by removal of bone.

DR. CHARLES B. NANCREDE, Ann Arbor, reported cases in which cure had followed operation for traumatic epilepsy. In one the cure

as of ten years' duration. Often cases that are reported as failures soon after the operation prove to be cures when followed for a longer time. The operation removes only one of the elements that is causing the epilepsy. In speaking of these operations, he stated that hæmorrhage from the skull could be checked by forcing in the diploë. In regard to simple fissured fracture, he asked how the diagnosis could be made.

DR. ROSWELL PARK, Buffalo, differed from the author as regards the results of operations for epilepsy. He had himself had cases in which decided benefit was afforded. In order to determine the effect, time must elapse, so that the epileptic habit may disappear. The operation removes the anatomical cause, but ordinary therapeutic measures are needed to counteract the secondary conditions. Reference was also made to the relief afforded in brain tumors, even where the removal of the growth was not contemplated. He reported two cases of craniotomy for microcephalus in which benefit had followed.

DR. H. C. WOOD, Philadelphia, thought that we should wait before coming to any conclusions as to the result of treatment, either medicinal or surgical. He referred to one case in which, under medicinal treatment, the attacks remained absent for seven years, and then returned. He advised that in these cases, before the contemplated operation was performed, a mock operation should be done, and the effect noted. He cited cases in which such measures had been followed by benefit.

DR. J. J. PUTNAM, Boston, thought that a simple, smooth, depressed fracture would not be likely to cause any symptoms. The irritation from a sharp spicule of bone probably will cause irritation. Probably the most important element in the causation of trouble is the results of the original injury to the cortex. The interstitial changes in the cortex take the form of sclerosis, and it seems *a priori* doubtful that removal of the bone would materially affect it. The operation may not prove indifferent, for the cicatrization of the incised may lead to harm.

MR. THOMAS BRYANT, London, had been much struck with the emphasis with which Professor Agnew had insisted upon the treatment to be followed in depressed fracture. As a practical rule, he was disposed to agree with him; but there are certain exceptions. He did not think it wise to encourage practitioners to trephine and elevate every case of depressed fracture. He could recall many cases of depressed fracture, followed for years, in which no symptoms followed. Depression of the lateral aspects of the skull are not so apt to be followed by symptoms as depression of the vault of the skull. From these remarks, he said, it would naturally follow that he disagreed with the observation that in

every case of fissure of the skull operation should be done. He wished Dr. Agnew had gone more thoroughly into the reason for this statement. If there had been no brain symptoms, although the blow may have been sufficient to cause fracture, it would not be wise to insist that we should at once proceed to explore to see if there is fracture. It is better to wait and watch for symptoms, being ready to operate as soon as there is a suggestion of something wrong. Although the risk of exploratory operation may be slight, yet it must be admitted that it is attended with some danger.

DR. D. HAYES AGNEW, in traumatic epilepsy, did not condemn operation, but curative results should not be expected from it. Its result is only one of amelioration. He could not withdraw his statement made in the paper, for in many of the cases of traumatic epilepsy there has been no history of unconsciousness or other symptom. There has been a blow on the head, and many years later epilepsy has appeared. It is impossible to determine the condition of the internal table of the skull by inspection of the external table. He had seen a simple crack in the skull, with the internal plate forced downwards some distance.

A paper on "Resection of the Wrist," by DR. RAFAEL LAVISTA, of Mexico City, Mexico, was presented and read by title.

Report of a committee on the

RESULTS OF TREATMENT OF SIMPLE FRACTURE OF THE SHAFT OF THE FEMUR,

Read by STEPHEN SMITH, M.D., of New York.

At the meeting of the American Surgical Association, held May 15, 1890, the following preamble and resolution was adopted:

WHEREAS, in the treatment of fractures of the shaft of the femur, the question often arises as to what is a satisfactory result in a given case; therefore,

Resolved, That a committee be appointed by the President, to report at the next meeting of the Association, what, in their judgment, under the methods of treatment, should be considered as satisfactory results.

The following committee was appointed: Dr. Stephen Smith, New York; Dr. D. Hayes Agnew, Philadelphia; Dr. David W. Cheever, Boston; Dr. D. W. Yandell, Louisville; Dr. Chas. T. Parkes, Chicago; Dr. P. S. Conner, Cincinnati; Dr. Charles B. Nancrede, of Ann Arbor, and Dr. Hunter McGuire, Richmond, Va.

The question referred to your committee has an important bearing upon the jurisprudence of surgical practice. One of the most frequent causes of prosecution of surgeons is the alleged mal-treatment of fractures of the femur.

The following circular was sent by the committee to the members:

"What should be considered as a satisfactory result (other than perfect union) in the treatment of a simple fracture of the shaft of the femur?"

The committee has reviewed the several questions raised and endeavored to secure a common ground on which the Association can take its position, and on which members can individually stand before the courts.

1. Bony union: The necessity of firm bony union does not admit of discussion. The amount of callous should not be taken as a criterion of the success of treatment.

2. Relation of long axis of the fragments: While it is the aim of the surgeon to restore the normal relation of the long axis of the fragments, yet it is generally impossible to secure exact apposition of the fractured surfaces, nor can the normal long axial line be restored with mathematical precision.

3. Correspondence of the anterior surfaces of the fragments: On this depends the position of the foot. The result of treatment, to be satisfactory, requires that the anterior surface be in the same planes.

4. Length of limb: This was formerly regarded as the test of success of treatment. The records of the past show that shortening was the universal rule. The discovery of the natural discrepancy in the length of the lower limbs has considerably modified our estimate of this test. Ninety per cent. of healthy, uninjured persons have lower limbs of unequal lengths. In thirty-five and eight-tenths per cent. the right limb is the longer; in fifty-four and three-tenths per cent. the left is the longer. If the amount of shortening does not exceed the average natural difference in the length of the limbs—viz., about one-half an inch—the result will be in accordance with the laws of nature in the conformation of the lower extremities. If the shortening does not exceed the extreme limit of difference in the lengths of the natural limbs—viz., about one inch—the result should be considered satisfactory. An unsatisfactory result as regards shortening exists only when the amount of shortening exceeds one inch.

5. Lameness: This is a symptom of variable importance. Some will have a limp with one-fourth inch shortening, while others will not limp with one-half or one inch shortening. In many cases the limp disappears with time, or if it continues it is the result of careless habits of the patient.

6. Restoration of function: Essential to the function of the femur is strength of the femur at the seat of fracture, free and unimpeded action of the muscles, and proper motion of the knee joint. The determination of the degree of restoration of function cannot be made for at least one year after the cessation of treatment.

7. Conditional results: There is a class of cases in which our estimate of results must be based upon a careful study of the special circumstances connected with the treatment of each case.

Results widely different from those already given must be regarded as satisfactory, when we consider the circumstances under which the treatment is necessarily pursued. The treatment may have been conducted under circumstances in which it was impossible to secure proper apparatus, or the injury may have involved other parts so as to prevent the patient from taking the necessary position, or the patient may have suffered from delirium or other malady.

The following conclusions were presented:

A satisfactory result has been obtained in the treatment of fracture of the shaft of the femur when—

1. Firm bony union exists.

2. The long axis of the lower fragment is either directly continuous with that of the upper fragment, or the axes are on nearly parallel lines, thus preventing angular deformity.

3. The anterior surface of the lower fragment maintains nearly its normal relation to the plane of the upper fragment, thus preventing undue deviation of the foot from its normal position.

4. The length of the limb is either exactly equal to that of its fellow, or the degree of shortening falls within the limits found to exist in ninety per cent. of healthy limbs, viz., from one-eighth of an inch to one inch.

5. Lameness, if present, is not due to more than one inch of shortening.

6. The conditions attending the treatment prevent other results than those obtained. Adjourned.

WEDNESDAY MORNING.

DR. A. G. GERSTER, of New York, read a paper on

ASEPTIC AND ANTISEPTIC DETAILS IN SURGERY.

Personal cleanliness and cleansing of the field of operation are to be accomplished by mechanical measures, rather than by disinfectants. The dirt and oily matter of the skin is removed by emollient potash soap and stiff brush. This is followed by the germicidal lotion. The hands of the surgeon may be sterilized in the following manner: The nails are trimmed short, the hands scrubbed with soap and brush in hot water for one minute. The nails are then cleaned, and the hands immersed in strong alcohol, and then washed in 1:1,000 corrosive sublimate solution. Brushes require careful attention. They may be sterilized by boiling for five minutes in water containing 1 per cent. of washing soda. They should be kept in 1:1,000 bichloride solution.

Instruments are sterilized by boiling for five minutes in soda solution, in a covered vessel. The addition of the soda prevents formation of rust.

Dressings are rendered absorbent and sterilized by steam. Strong antiseptic agents in dressings are objectionable from their action on the spine.

Dressings may also be sterilized by boiling in soda or potash lye.

The use of Florida sponges was recommended, as, owing to their cheapness, they can be used once and then thrown away. Boiling of sponges is to be condemned. Sponges are best prepared by heating, followed by immersion in dilute muriatic acid. Acid is removed by washing, then immersed in water for two days to permit the spores to germinate. Each sponge is then kneaded in hot water for one minute with potash or soft soap. They are then placed in 5 per cent. carbolic acid solution for twenty-four hours. As a substitute for the large flat sponge used in laparotomy, he recommended the use of pads of absorbent gauze.

In operating few instruments, sponges and assistants should be employed. The dissection should be clean, the tissues being cut rather than torn. Irrigation should not be employed except when special indications present. In the abdominal cavity irrigation was condemned. When the peritoneal cavity is contaminated by pus, etc., simple wiping away of the matter is sufficient.

In perfectly aseptic operations, no drainage is required. Iodoform gauze can often be substituted for the use of tubes. Drainage by tubes is required where there is progressive suppuration.

In combating septic morbid processes, mechanical measures, such as incision, drainage and irrigation, are of more importance than chemical measures.

DR. J. COLLINS WARREN, Boston, described the details of operative surgery as practiced in the Boston city hospital, the Massachusetts general hospital and the children's hospital.

DR. J. WILLIAM WHITE, Philadelphia, thought that the time had not yet arrived when the use of antiseptics could be dispensed with. He preferred an antiseptic dressing in all cases except where the wound is absolutely sterile, and where no discharge is to be expected. While in a general way he agreed as to the value of mechanical measures in cleansing the skin, he saw no good reason for throwing aside entirely the use of the weaker chemical solutions. There are so many cases in which we cannot be sure that the wound is aseptic, antiseptic dressings become of importance. He had tried the gauze substitute for sponges in abdominal work, but found it objectionable from the fact that when the gauze remains long in contact with the intestines, threads of the gauze adhere to the intestine.

DR. JOSEPH RANSOHOFF, Cincinnati, said that in some cases it was absolutely impossible to render the part aseptic, and cited cases illustrating this point. In cases where it becomes clear that the wound is infected, he removes the dressings, and soaks the part in hot water. He had discarded the use of sponges altogether. In the majority of cases he employs the aseptic dressing,

but could see no harm in the use of antiseptic dressings. Dressings, etc., in private practice may well be sterilized by heating in the oven. He thought that tight closing of the wound should be practiced oftener than it now is. Drainage is rarely used except in wounds already septic. He often uses catgut for drainage. In the septic cases he thought that probably the surgeon was often responsible for the infection of the wound. By clean incisions, cutting far away from the disease, and by not using the sharp spoon too freely, infection of the wound in suppurating cases can often be prevented.

DR. E. M. MOORE, Rochester, asked what objection was there to irrigation. In amputations, for instance, irrigation with 1:1000 bichloride solution affords a ready means of removing clots, etc. The clots are removed, and the wound can be left in a dry state. If this irrigation does no harm, why not use it? Dr. Gerster had condemned it, but he had not given his reasons for such condemnation. In certain cases of abdominal section, especially where there was oozing of blood, the use of hot irrigations of aseptic water were of great service.

DR. GERSTER, in concluding, said that he did not condemn antiseptic methods. He employed both methods. In its proper place, asepticism is infinitely superior to anti-septicism, but the cases must be properly selected. Teachers must be careful not to go too far in advance of the rest of the profession. Those who have not learned the detail should be warned to stick to the older methods, gradually approaching the higher.

DR. J. WILLIAM WHITE, of Philadelphia, read a paper on

THE SURGERY OF THE SPINE.

The conditions discussed were: Congenital deformities; tuberculosis of the spine; neoplasms and traumatism. Under the first head, spina bifida is the only condition requiring consideration. In this, injection by an iodo-glycerine solution offers the greatest prospect of ultimate recovery with the least immediate danger. In tuberculosis of the spine the indications for interference are the evacuation of pus, removal of a sequestrum or of a focus of carious bone, and relief of the cord from pressure. There are records of fourteen operations upon the bodies of vertebrae for abscess, with eight cures, five cases improved, and one death, which had no relation to the operation. There have been forty cases of operation on the spine for the relief of pressure. In twenty-two there was either improvement or cure. The effect of suspension in the treatment of Pott's paralysis has been so favorable that it should occupy a prominent position.

Conclusions in regard to operative treatment

of spinal tuberculosis with symptoms of pressure on the cord were:

1. The paralysis in Pott's disease is not, as a rule, due to a transverse myelitis or hopeless degeneration, and is not usually due to the pressure of the carious or displaced vertebrae, but is, in the majority of cases, the result of an external pachymeningitis which results in the formation of an extra-dural connective tissue tumor.

2. Speaking generally, a favorable prognosis is to be given, especially in children, in cases of Pott's paralysis in which the abscess, if any exists, can be evacuated; the treatment by extension, and with plaster jacket, can be employed and the patient can be put under the most favorable hygienic conditions.

3. In cases in which all this has been tried unsuccessfully, or in those in which the disease is slowly but steadily progressing to an unfavorable termination, where with more or less complete loss of motion and sensation below the level of the lesion there are incontinence of urine and feces and the development of bed-sores, and especially when acute symptoms threaten life, resection becomes entirely justifiable.

4. Operation having been decided upon for any or all of the above reasons, the prognosis will be favorable in direct proportion to the youth and strength of the patient, the absence of generalized tuberculosis, and the nearness of the lesion to the base of the sign.

5. When the tuberculous process affects the arches and there is paraplegia, we may sometimes operate, hoping not only to free the cord, but at the same time remove the focus of disease. This double indication may also be fulfilled in those cases where, without bony disease, there is posterior pachymeningitis or a tuberculoma occupying the canal.

6. If the lesion of the bodies of the vertebrae is in the lumbar region at a point where these bodies are accessible, it might be possible in certain cases to expose the cord from the back, by removal of the laminae, with the object not only of removing pressure but of reaching and taking away the diseased bone and tubercular granulation.

7. In tuberculosis of the body of a vertebrae and compression of the cord by anterior pachymeningitis we can fulfil only one indication—liberate the cord from the pressure. We should operate only in grave cases when acute compression, the appearance of respiratory complications, the rapid development of degenerative processes force us to interfere, or where the course of a chronic case is steadily toward a fatal termination, although no advanced visceral tuberculous lesions are present.

In regard to neoplasms it was said that every case of focal spinal lesion thought to depend on a tumor, and not distinctly a malignant and gen-

eralized disease, should be regarded as amenable to operative interference, no matter how marked the symptoms of pressure may be, nor how long continued.

Traumatism.—The indications and contraindications for trephining in spinal fractures are based on the following points:

1. The nature of the vertebral lesion and the nature and extent of the medullary lesion.

2. The time which has elapsed since the traumatism.

3. The regional level of the medullary lesion.

The following conclusions were presented:

1. Some objection urged against operative interference in spinal traumatism, *i.e.*, hæmorrhage, frequency of absolute destruction of the cord, pressure from inaccessible fragments of bone, etc., have been shown to be unsupported by clinical facts; others were largely due to a well-founded dread of *a*, the shock, in those cases operated on in pre-anæsthetic times; and *b*, consecutive inflammation, suppuration and pyæmia in pre-antiseptic periods.

2. Some results of recent operative interference in properly selected cases of fracture of the spine are encouraging, and should lead to the more frequent employment of resection of the posterior arches and laminae; *a*, in all cases in which depression of those portions, either from fracture or dislocation, is obvious; *b*, in some cases in which, after fracture, rapidly progressive degenerative changes manifest themselves; *c*, in all cases in which there is compression of the cauda equina from any cause, whether from anterior or posterior fracture, or from cicatricial tissue; *d*, in the presence of characteristic symptoms of spinal hæmorrhage, extra- or intra-medullary.

3. Operation is contraindicated by a history of such severe crushing force as would be likely to cause disorganization of the cord. The question which will remain in doubt previous to operation will usually be that of the extent of damage done to the cord, and the possibility of its taking on a reparative action. As to this, the safest rule is that which has been formulated by Lauenstein, namely, that if after the lapse of six or ten weeks there is incontinence of urine or incontinence of feces, and especially if there is also the development and spreading of bed sores, but little is to be hoped for from the unaided efforts of nature. If, however, these symptoms are absent, and if there be the least improvement, it will be proper for the surgeon to delay operative interference still longer.

DR. H. H. MUDD, of St. Louis, dwelt upon the importance of remembering the liability to severe shock in these spinal operations. He reported three cases of bullet wounds of the spinal column, one of which ended fatally.

DR. JOHN B. ROBERTS, of Philadelphia, insisted that injuries and diseases of the spine, of a

surgical kind, should be treated as we treat injuries of the cranial cavity. Cases of Pott's disease with angular curvature have been referred to, but sufficient stress has not been laid upon the fact that many of these cases with motor paralysis improve under ordinary remedies, the inflammatory exudation being absorbed. In traumatism of the spine, we should explore the spine as we should explore the brain. In severe injuries with fracture, spiculæ of bone are often driven down on the canal.

DR. J. J. PUTNAM, of Boston, thought that the dangers of inflammation had not been sufficiently dwelt upon. Some cases of spinal injury, in from one to four years, show some improvement. In such cases, an operation may add to the improvement.

DR. JAMES McCANN reported two cases of spinal injury in which operation had been performed. In one death followed. In the other there was great improvement.

DR. N. SENN, of Chicago, read a paper on
THE TREATMENT OF TUBERCULOSIS OF BONES
AND JOINTS BY PARENCHYMATOUS AND
INTRA-ARTICULAR INJECTIONS.

The following conclusions were presented:

1. Parenchymatous and intra-articular injections of safe anti-bacillary substances are indicated in all subcutaneous tubercular lesions of bones and joints accessible to this treatment.

2. Of all substances so far employed in this method of treatment, iodoform has yielded the best results.

3. The curative effect of iodoform in the treatment of local tuberculosis is due to its anti-bacillary effect, and its stimulating action on the healthy tissue adjacent to the tubercular product.

4. A 10 per cent. emulsion in glycerine or pure live oil is the best form in which this remedy should be administered subcutaneously.

5. The ethereal solution should never be employed, as it is liable to cause necrosis of the tissues overlying the abscess, or iodoform intoxication.

6. Tubercular abscesses and joints containing synovial fluid or tubercular pus should always be washed out thoroughly with a three to five per cent. solution of boracic acid before the injection is made.

7. Injections should be made at intervals of one or two weeks, and their use persisted in until the indications point to the cessation of tubercular inflammation and the substitution for it of a satisfactory process of repair, or until the result of this treatment has shown its inefficacy and indications present themselves of the necessity of resorting to operative interference.

8. If the treatment promises to be successful, symptoms pointing to improvement manifest themselves not later than after the second or third injection.

9. In tubercular empyema of joints and tubercular abscess, gradual diminution of the contents of the joints or abscesses at each successive tapping and lessening of the solid contents of the fluid and increase of its viscosity, are the conditions which indicate unerringly that the injections are proving useful, and that in all probability a cure will result from their further use.

10. Moderate use of limb is compatible with this method of treatment, provided the disease has not resulted in deformities which would be aggravated by further use of the limb. In such cases, correction of the deformity should be postponed until the primary joint affection has been cured by the injections.

11. Parachymatous and intra-articular medications, with anti-bacillary material, has yielded the best results in tubercular spondylitis, attended by abscess formation and tuberculosis of the knee and wrist joints.

12. This treatment may prove successful in primary osseous tuberculosis, followed by involvement of the joint, provided the osseous foci are small.

13. Extensive sequestrums of articular ends, with secondary tubercular synovitis, always necessitates resection, but preliminary treatment by iodoform injections into the affected joints constitutes a valuable preparatory treatment to the operation, and adds to the certainty of a favorable result.

14. In open tubercular affections of joints, incision, scraping, disinfection, iodoformization, iodoform gauze tampon, suturing and subsequent injections of iodoform emulsion is advised, and yields excellent results, and should be employed in all cases in which a more formidable operation can be avoided.

15. Balsam of Peru ranks next to iodoform in the treatment of tubercular affections of bones and joints, and if the latter remedy, for any reason, can not be employed, or has failed in affecting the desired result, it should be given a fair trial, if operative treatment is not urgently indicated.

(To be concluded.)

NECROLOGY.

David Humphreys Storer, M.D., LL.D. and
Ex-President.

This estimable and honored physician and scientist has passed away, *ad majores*, ripe in years and character. He was, with one exception, the senior surviving president of our Association. He presided in 1866, being the immediate successor in office of the Nestor, Davis, who held the chair at the second Boston meeting, in 1865. The convention over, which Dr. Storer presided was held at Baltimore, the first southern city to entertain our organization after the signature of peace and the

healing up of internecine wounds had begun in good earnest. Dr. Storer was born at Portland, Maine, March 26, 1804, and in that city received his early training. He was an alumnus of Bowdoin College, of the class of 1822, graduating at the early age of eighteen. In 1876 that same institution conferred upon him a doctorate in laws. He studied medicine with Dr. John C. Warren, of Boston, obtaining his medical degree from the Harvard School in 1825. Five years later he, with Drs. Oliver Wendell Holmes, Jacob Bigelow and one or two others, founded the private medical school which was known as the Tremont Street School, and which was a pioneer in that kind of systematic tuition and drill of students. This school was a gain to the cause of medical education in that vicinity, and was one of the incentives to the subsequent establishment of a summer term in the medical department of Harvard. He likewise assisted in the formation of the Society of Natural History, and for years gave to it freely of his evening hours, and to the subjects of natural history much interest and research. To the department of ichthyology, especially, he contributed some valuable memoirs. In 1837 his scientific reputation was such that he received a state appointment to report upon the zoology and herpetology pertinent to the then closing State survey. In 1845 he contributed to the New Haven meeting of American Naturalists his standard synopsis of the fishes of North America; and later he brought out his illustrated quarto on the "Fishes of Massachusetts." He became a visiting physician to the general hospital of the State in 1849, served for nearly a decade, and was then promoted to a consultant's position, which he retained over thirty years.

His membership in the Massachusetts Medical Society dates from 1829; and he was the Senior Fellow residing in Boston at the time of his decease. He delivered the annual discourse before the Society in 1851, taking for his subject "Medical Jurisprudence;" and this was the same subject-matter that a few years later made a part of his chair in the Harvard Medical School. He was in his fiftieth year when he was chosen to succeed Dr. Walter Channing as professor of the theory and practice of obstetrics and medical jurisprudence. This chair was filled by him acceptably and eloquently from 1854 to 1868. His lectures were seldom shirked by the students, but on the contrary they added popularity to the college. He was dean of the school for nine years. In 1868 his active participation in college duties ceased by resignation. His interest in the Association was early enlisted, and he attended a majority of the meetings in the first decade of its history, being made one of the vice-presidents in 1855. He was especially prominent in the proceedings at the Charleston Convention when the question of Dr. Ramsey's obstetrical statistics was made a cover for an attack upon the Association. He was at that time the chairman of the Committee on Obstetrics, the branch of medicine which, with the diseases of women, engaged his special attention. He was one of the few who were made honorary members of the American Gynecological Society, at its foundation in 1876. He was a forcible and clear speaker in the debates of his chosen societies, and he had a quick intuition as against measures and methods that

opposed the progress and honor of the profession, but of late years he has been little known in the medico-literary world. Fifty years ago he was prominent in a committee on library in the State Medical Society, and some of the results of his committee's labors rest among the 10,000 medical volumes on the shelves of the Public Library of Boston. Within the past two years, however, his friends and former students have made it possible for the Medical Library Association of that city to place upon its walls an exceptionally fine portrait of this lover of books, of natural science and of the healing art. When he was seventy-nine years old he was troubled with vesical calculus, and was operated upon successfully by the late Dr. H. J. Bigelow. His retirement from professional activity had been gradually progressing before that operation, but after that it became more decisive. This retirement, however, left him with a mind well furnished for life's decline, and he sustained his long-time reputation for cordiality and geniality and a lively sympathy with the junior members of the profession. The date of his death was September 10.

BOOK REVIEWS.

REGIONAL ANATOMY IN ITS RELATION TO MEDICINE AND SURGERY. Illustrated from photographs taken by the author of his own dissections, expressly designed and prepared for this work, and colored by him, after Nature. By GEORGE MCCLELLAN, M.D. Vol. 1. Imp. 4to. Pp. 431. Philadelphia: J. B. Lippincott & Co., 1891.

As the title indicates, the book is original in its design and execution. This work covers not only the matter usually comprised in ordinary works on surgical anatomy, but as well the surface anatomy, or "land-marks." Surface anatomy is not only a necessary study for the artist, but for the surgeon, especially in these days of the phylotomists, when every swelling must be "explored," and the unfortunate abdomen slashed open whenever there is any unusual change in its contour. The more knowledge of surface anatomy, the less "exploratory" slashing. The more knowledge of surface anatomy, the more accurate the diagnoses in injuries of the joints, and the fewer the litigants in malpractice suits. Prof. McClellan, himself a teacher of anatomy in the Pennsylvania Academy of Fine Arts, as well as in a medical school, has given the most complete exposition of the subject.

The illustrations are accurate and handsomely executed, the coloring is natural, and the book is one of which all American medical men may well be proud, and the author has in this work added new laurels to a line already distinguished in the annals of American medical literature.

The publishers have done their part well; the paper is good, the typography excellent, and the whole make-up is highly creditable to the house.

There are many books which the general practitioner and surgeon can better afford to spare than this one.

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SATURDAY, OCTOBER 3, 1891.

CREATIN IN TUBERCULOSIS.

In a report to *The Times and Register*, Sept. 26, 1891, Prof. SAMUEL G. DIXON, of Philadelphia, gives the results obtained by injections of creatin in tuberculous animals. His own experiments were made on tuberculous and healthy rabbits and guinea-pigs, the results being as satisfactory as could be expected with these particular animals. At his request, W. L. ZUILL, M.D., Professor of Veterinary Surgery in the University of Pennsylvania, made experiments on healthy and tuberculous cows. Prof. ZUILL reports as follows:

TO PROFESSOR SAMUEL G. DIXON, M.D.:

Dear Doctor:—I hereby submit to you the clinical results obtained from the subcutaneous injection of creatin in tuberculous cattle. The experiments were made in accordance with our pre-arranged plan, and have extended over the last two months. The results obtained in these experiments more than fulfill my utmost expectations, and are in every respect identical with those which I have obtained with tuberculin. The physiological action of creatin in tuberculous cows is so exact and identical with tuberculin that it is impossible to recognize a clinical difference. Its influence upon circulation and respiration is well marked in animals suffering with miliary tuberculosis of the lungs, but large doses of the drug do not react upon these organs should the disease be confined to the other tissues of the body.

The action of creatin upon tuberculous tissues is intensely energetic, causing rapid necrosis of this tissue, giving it the appearance of having undergone a cystic degeneration. The cheesy degeneration of tuberculous tissue seemingly disappears, and its place is taken by necrotic cavities filled with serum, in which float threads and masses of the tuberculous structure more or less large.

August 13.—Experiment No. 1 was made with one-twentieth of a grain of creatin in a tuberculous cow, with no well-marked reaction.

August 27.—Experiment No. 2 was made with one-sixth of a grain of creatin in a tuberculous cow, which caused an elevation of temperature from one hundred and one to one hundred and four and one-fifth degrees F.

September 9.—Experiment No. 3 was made with one-half of a grain of creatin in a tuberculous cow, and caused an elevation of temperature from one hundred and one and one-fifth degrees to one hundred and three and four-fifths degrees F.

September 21.—Experiment No. 4 was made with 1 gr. of creatin in a tuberculous cow, and caused a reaction in temperature from one hundred and two and one-fifth degrees to one hundred and five and three-fifths degrees F.

September 4.—Check experiment No. 2 was made with $\frac{1}{6}$ of a gr. of creatin in a healthy cow, and no reaction could be observed.

September 9.—Check experiment No. 3 was made with $\frac{1}{2}$ of a gr. of creatin in a healthy cow, and no reaction could be observed.

September 24.—Check experiment No. 4 was made with 1 gr. of creatin in a healthy cow, and no reaction could be observed. Respectfully,

W. L. ZUILL.

It is to be borne in mind that the normal temperature of the cow is from 101° to $102\frac{1}{2}^{\circ}$ F.

Prof. DIXON has on hand a series of experiments with other members of the amide group, viz.: allantoin, glycosin, tyrosin, creatinin, taurin, cystin, etc.

WE CONGRATULATE the readers of THE JOURNAL upon the large amount of valuable original matter presented this week. In addition to the usual amount of Section work of the Association, our readers have before them a very full abstract of the proceedings of the general session of the Congress of American Physicians and Surgeons, held last week in Washington, as well as a partial report of the proceedings of the American Surgical Association.

THE DOCTORS OF NORTHERN OHIO will gather at Mansfield, November 5-7, for at that time and place, the three Societies of Northern Ohio, viz.: the Northwestern Ohio Medical Society, the North Central Ohio Medical Society, and the Northeastern Ohio Medical Society, hold a union meeting.

On the evening of November 5, the Hon. John Sherman will give a reception in honor of the Association, and the next evening the Hon. M. D. Harter will give a reception. The Committee of Arrangements consists of Drs. R. Harvey Reed, J. W. Craig and Geo. Mitchell, all of Mansfield.

DR. FRANK W. REILLY, of Chicago, has been appointed Secretary of the State Board of Health

of Illinois, vice Dr. John H. Rauch, resigned. In accepting the resignation of Dr. Rauch the Board passed complimentary resolutions, warmly eulogizing him, which are this week crowded out on account of the great pressure upon our columns.

His successor, Dr. Reilly, was for many years a surgeon in the Marine-Hospital Service, and afterwards a well-known writer for the daily press. He was Dr. Rauch's assistant for some months, and for the last four years has been the managing editor of the *Chicago Daily News*.

Bringing a trained pen to the service of the Board, his success as Secretary is well assured.

MISCELLANY.

ILLINOIS ARMY AND NAVY MEDICAL ASSOCIATION.—The Illinois Army and Navy Medical Association was organized at Springfield, Ill., June 26, 1890, with Dr. Hosmer A. Johnson, of Chicago, as President, and Dr. John H. Rauch as Secretary. The objects of the Society are, the promotion of social intercourse, and historical and medical subjects connected with the late War. All reputable physicians now living in Illinois, whether in practice or not, who served in the Army or Navy during the late War, and all who were Surgeons, or Acting Asst. Surgeons, who were with Illinois troops, and are now non-residents of the State, are eligible to membership. At the second meeting of the Association, held in Springfield, May 18 and 19, 1891, Dr. John H. Rauch was elected President, vice Dr. Johnson, deceased, and Dr. Edward P. Bartlett, of Springfield, was elected Secretary. The Association adjourned to meet in Chicago, at the time of the unveiling of the Grant Monument. This adjourned meeting will take place at the Grand Pacific Hotel, October 7 and 8, 1891. All physicians who served in the Army or Navy, during the late War, are cordially invited to meet with us. The unveiling of the monument will take place October 7, at 2 P.M.

Reduced rates are promised by the railroads.

EDWARD P. BARTLETT, Sec'y.

AMERICAN MEDICAL ASSOCIATION—SECTION ON SURGERY.—The Chairman of the Section requests members who expect to present papers in this Section to forward the titles of their contributions as soon as possible to the secretary of the Section, F. W. MANN, M.D., Detroit, Mich. The programme is being rapidly filled, and it is the desire of the officers to make it thoroughly representative in all departments of surgical work.

MITCHELL DISTRICT MEDICAL SOCIETY.—The semi-annual meeting of the Mitchell District Medical Society will be held at Columbus, Ind., Thursday and Friday, December 17 and 18, 1891. Physicians desiring to read papers at this meeting will please forward the titles of

their papers immediately. This promises to be one of the best meetings ever held by this well-known medical Society.

GEO. T. MCCOY, M.D.,
Chairman Com. of Arrangements.

ANNALES D'OCULISTIQUE.—This long-established and widely known ophthalmological journal, conducted during many years with distinguished ability by the late Professor Warlomont, has, since the death of that illustrious leader in ophthalmology, passed into the editorial hands of Drs. Valude and Sulzer, who have transferred the office of publication from Brussels to Paris.

The new management has doubled the size of the journal and promises to increase its usefulness.

Dr. George T. Stevens, of New York, the American collaborator, will report matters of ophthalmological interest from this country.

Those who are familiar with *Annales d'Oculistique* will have already observed a very marked change in the prominence given to American literature in the last two numbers.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from September 19, 1891, to September 25, 1891.

Asst. Surgeon Theodore F. DeWitt, U. S. A., granted leave of absence for six months, on surgeon's certificate of disability.
Asst. Surgeon Jefferson R. Kean, U. S. A., granted leave of absence for three months, on surgeon's certificate of disability.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending September 26, 1891.

P. A. Surgeon E. H. Marsteller, detached from U. S. S. "Petrel," and granted one month's leave.
P. A. Surgeon O. D. Norton, detached from special duty at Naval Academy, and to the U. S. S. "Petrel."
Surgeon J. H. Hall, detached from Naval Hospital, Chelsea, Mass., and placed on waiting orders.
Surgeon G. P. Bradley, ordered to Naval Hospital, Chelsea, Mass.
Surgeon C. U. Gravatt, ordered to Naval Hospital, Brooklyn, N. Y.
P. A. Surgeon J. F. Gardner, detached from Naval Hospital, New York, and to the Naval station, New London, Conn.
Asst. Surgeon J. H. North, detached from Navy Yard, New York, and wait orders.
Asst. Surgeon Geo. A. Lung, detached from Naval Station, New London, Conn., and to the Navy Yard, New York.
Surgeon M. H. Simons, detached from the "Enterprise," and to hold himself in readiness for sea service.

Official List of Changes of Stations and Duties of Medical Officers of the U. S. Marine-Hospital Service, for the Six Weeks Ending September 19, 1891.

Surgeon George Purviance, granted leave of absence for thirty days. August 22, 1891.
Surgeon W. H. Long, granted leave of absence for twenty-two days. August 18, 1891.
Surgeon H. W. Austin, to proceed to Delaware Breakwater Quarantine Station as Inspector. August 28, 1891. Granted leave of absence for thirty days. September 3, 1891.
Surgeon J. M. Gassaway, granted leave of absence for ten days. September 19, 1891.
Surgeon G. W. Stoner, granted leave of absence for ten days. August 15, 1891.
P. A. Surgeon H. R. Carter, to proceed to Cape Charles Quarantine for temporary duty. August 27, 1891.
P. A. Surgeon W. A. Wheeler, to proceed to Cape Charles Quarantine for temporary duty. August 27, 1891.
P. A. Surgeon C. E. Banks, granted leave of absence for eleven days. September 3 and 9, 1891.
P. A. Surgeon D. A. Carmichael, leave of absence extended thirty days on account of sickness. September 10, 1891.
P. A. Surgeon A. H. Glennan, granted leave of absence for seven days. August 29, 1891.
Asst. Surgeon G. M. Guiteras, relieved from duty at San Francisco, Cal.; to proceed to New Orleans, La., for special duty. September 14, 1891.
P. A. Surgeon C. P. Wertenbaker, granted leave of absence for thirty days. September 10, 1891.
Asst. Surgeon J. C. Perry, to proceed to Evansville, Ind., for temporary duty. September 18, 1891.
Asst. Surgeon G. B. Young, granted leave of absence for eight days. August 29, 1891. To proceed to Cairo, Ill., for temporary duty. September 15, 1891.
Asst. Surgeon E. R. Houghton, to proceed to Vineyard Haven, Mass., for temporary duty. August 29, 1891. Granted leave of absence for sixty days, and permission to go abroad. September 18, 1891.

PROMOTION.

Asst. Surgeon H. T. Goodwin, commissioned as P. A. Surgeon, to date from September 24, 1891. September 18, 1891.

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ORIGINAL ARTICLES.

THE TREATMENT OF HYPERTROPHIED TONSILS.

*Read by title before the Section of Laryngology and Otology, at the
Forty-second Annual Meeting of the American Medical
Association, Washington, D. C., May 1, 1891.*

BY CHAS. H. KNIGHT, M.D.,

OF NEW YORK.

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An enlarged tonsil may project beyond the pillars of the fauces without giving rise to any special subjective symptoms, or it may provoke serious disturbance and yet be invisible except during the act of retching. It may interfere with hearing, impede breathing, or obstruct swallowing, or it may simply be the cause of pharyngeal irritability or of various reflex disorders. The amount of functional derangement excited by an enlarged tonsil depends in part upon the relative dimensions of the faucial space and upon the temperament of the individual. Moderate hypertrophy in a contracted pharynx or in a neurotic subject may be the source of excessive annoyance, whereas an extreme degree of enlargement may be easily tolerated in a capacious pharynx or by a phlegmatic subject.

At the present day but few will be found to object to the statement that hypertrophied tonsils require to be reduced or removed, even in the absence of marked subjective symptoms. For whatever function these organs were intended it must be admitted that in their hypertrophied state they have become incapable of performing it, and are therefore useless appendages. Moreover, there is abundant clinical evidence to show that their presence invites contagion, and in the event of infection they become a serious complication.

For example, during an epidemic of diphtheria children with large tonsils are more prone to contract the disease and are apt to have it in a severe form. The old fallacy, as maintained by Ottenbourg,¹ that enlarged tonsils are a protection against croup, must give way to the modern and more scientific opinion that, even without having undergone marked increase in size, the tonsils

may become avenues for the admission of disease to the system, in consequence of a condition described by Zawarykin² as "rarefaction of the epithelium." Its pathological importance has recently been verified by Hodenpyl,³ who expresses the belief that "it has an important bearing upon the absorption of bacteria and their ptomaines and in the production of certain of the acute infectious diseases." Admitting, therefore, that diseased tonsils should not be ignored as of trifling consequence, we must answer the question as to the best method of treatment. So many elements are concerned that we may safely affirm that no one method is adapted to all cases. Those who cut every tonsil and look upon other methods as puerile and unsurgical, must often find their attempts at excision to some extent foiled by certain anatomical peculiarities, or by strenuous objection on the part of the patient. On the other hand, those who advocate the inviolable use of cauterization not infrequently accomplish by painful and tedious methods what might be done in a few moments with equal safety.

The treatment of enlarged tonsils may be divided into medical and surgical. The former may be dismissed in a few words, since clinical experience shows that the hypertrophied tonsil yields slowly if at all to internal medication, except, perhaps, in struma or anæmia. In such cases hygiene, diet and tonics may have a limited influence. The same is true of local applications resorted to for the purpose of promoting absorption. In the majority of cases whatever constitutional defects may be present are directly attributable to the tonsillar hypertrophy, and are best remedied by removing the latter. Without wasting time in futile efforts to amend the systemic condition we should resort at once to surgical measures.

The following enumeration includes most of the methods which have been or continue to be practiced. Some of them have long since been abandoned, while others have never found favor except in the hands of their promoters:

1. Electrolysis.
2. Massage.
3. Chemical caustics.
4. Galvano-cautery puncture, or ignipuncture.

5. Avulsion with forceps.
6. Ligation.
7. Enucleation by means of the finger.
8. The cold wire snare.
9. The galvano-cautery snare, or amygdalotome.

10. Excision by means of scissors, the bistoury, or the guillotine.

1. Electrolysis: Interest in this method is not altogether lost, since we find within the past month a contribution to the technique of electrolysis in enlarged tonsils. A bifurcated needle electrode has been devised by Dr. Henry L. Coit,⁴ and is said to facilitate the operation. The needle, which is inserted into the tonsil, carries the negative current, while the positive electrode is applied externally. The applications are made weekly, are painless and bloodless, and are supposed to promote "absorption of the fibrous exudation, without destroying the mucous membrane," whatever that advantage may be. At a recent meeting of the American Laryngological Association, during the discussion of a paper on the galvano-cautery in hypertrophied tonsils, Dr. T. A. DeBlois⁵ stated that he had obtained good results with electrolysis, making half a dozen punctures each day. He uses it only in adults. Cohen⁶ also mentions having used it successfully in certain cases, while in others the results were not worth the trouble. At best it appears to be very slow, and it would seem to be fair to question whether the other measures generally used in conjunction with the electrolytic treatment are not at least equally responsible for whatever slight shrinkage may be observed.

2. Massage is referred to by many writers, but it evidently has not been extensively used. Good results have been reported by Quinert,⁷ who recommends rubbing powdered alum into the tonsil.

3. Almost all the agents in the list of chemical caustics have been at various times employed to destroy enlarged tonsils. Not more than three have proved of permanent value, namely: nitrate of silver (Holmes),⁸ chromic acid (Donaldson)⁹, and London paste (Mackenzie).¹⁰ The first is most effective when passed into the lacunæ of the tonsil, the second is used after making small incisions, and the third is applied to the surface of the tonsil with a spatula. Several objections are common to all. Their action is slow and in some cases is limited with difficulty, so that they can be safely used only when we have the coöperation of our patient.

4. The foregoing objection applies with less force to galvano-cautery puncture and ignipuncture. The application of these agents is much more precise, the immediate pain and the inflammatory reaction are certainly no more than with chemical caustics. In a tolerant patient much more rapid work may be done, nearly the whole tonsil sometimes being destroyed at a single sit-

ting. In spite of the testimony of many recent writers (Saint Germain), I have not found that children submit quietly to this method of treatment, and even in adults, and with the free use of cocaine, a good deal of complaint is made. In my judgment galvano-cautery puncture is undoubtedly the best resource in those broad, flat, adherent and deeply embedded tonsils, which cannot be reached at all with the guillotine, and whose removal with the knife is more or less difficult and hazardous. Krishaber,¹¹ who is one of the most ardent advocates of ignipuncture, sums up his views as follows: It is not painful. It is attended by no complications and results are prompt. Its application is easy, and its use, except in rare cases, demands no extraordinary skill.

5 and 6. Avulsion with forceps and ligation are of historical rather than of present practical interest. The former seems to have been practiced in very early times, while the latter has been more recently advocated by Guillemeau and Moscati. In referring to the latter Krishaber remarks that it is dangerous because of the inflammatory reaction likely to ensue.

7. Enucleation by means of the finger was practiced by Celsus and it has been since his time occasionally used, probably more from curiosity than because it has anything to commend it. It seems to be easily performed, except when the attachments of the gland are unusually firm and dense. The contusion of the parts necessitated by removing a tonsil in this way would be likely to induce an excessive degree of soreness. (Bernardino,¹² Larghi,¹³ Borelli,¹⁴ Farmer.)¹⁵

8. With the cold wire snare (Jarvis)¹⁶ primary hæmorrhage should not occur, provided the section be not too rapid, but there is always, of course, a possibility of secondary bleeding unless the usual precautions as to diet, movements of deglutition, clearing the throat, etc., are observed. In the few cases in which I have used it the process has been extremely painful, the tightening of the loop, as it gradually contracted upon the tissues at the base of the tonsil, became more and more difficult, and the subsequent distress of the patient was certainly excessive.

9. In the adult, in whom we may have cause to expect hæmorrhage, or who refuses to be cut, the galvano-cautery snare or Dr. Jonathan Wright's¹⁷ ingenious adaptation of the electric current to the frame of the Mackenzie guillotine, will be found serviceable. Some dexterity is doubtless required for the successful manipulation of the snare, which is not the case with the electric amygdalotome. The latter is used precisely as if it were a cutting instrument. The most satisfaction will be found with these methods in protuberant tonsils from which the palatal folds are quite free.

10. In the large majority of cases excision is the operation of choice. In tractable cases the

knife may be used with safety, but it is difficult to see that it has any advantage over the guillotine. The latter, if properly handled, will give an equally good result, and is undoubtedly safer. Scissors are perhaps less dangerous than the knife, but must be more awkward to handle. Cohen seems to be almost the only authority who sees greater danger to the palatine folds in the guillotine than in the bistoury. The only cases of fatal hæmorrhage and, with but few exceptions, the only cases of alarming hæmorrhage have occurred after the use of the bistoury.

Leaving out of the question the condition of hæmatophilia, in which a cutting operation is of course contraindicated, we find four possible sources of hæmorrhage after excision of the tonsils: 1. Wound of an anomalous ascending pharyngeal artery. 2. Injury of an abnormally vascular pillar. 3. Section of the venous plexus sometimes found at the lower border of the tonsil. 4. An enlarged and patulous artery in the body of the tonsil itself. The first two may exist at any age, but are likely to be met with only when the bistoury is used rather than the guillotine. The third occurs only in adults, and the fourth is certainly not common before puberty. My own conviction is that the danger of hæmorrhage from any source has been grossly exaggerated, largely perhaps in consequence of the unfortunate fact that many of those in the habit of excising tonsils are not schooled in general surgery and are hence easily alarmed by the sight of blood.

In my experience it is not the vascular looking tonsil that bleeds. From such a tonsil the flow of blood may be at first profuse, but it is soon checked by the ready retraction of the blood vessels. It is the pale, fibrous tonsil of the adult and of advanced childhood which gives us trouble. And the explanation is obvious. A tonsil of this kind is characterized by large increase of its connective tissue, by which the blood vessels are held open. A clot forms with difficulty and possibly only on the approach of syncope, as the pressure from behind diminishes. The foregoing statement suggests a point as to the amount of tonsil to be removed. It has repeatedly been said that it is merely necessary to remove the projecting portion, with the expectation that the remnant will ultimately shrink. It is curious to notice the difference of opinion expressed by various authorities on this subject. In his monograph on hypertrophied tonsils Paul Balme¹⁸ especially insists upon the importance of avoiding excessive outward pressure with the tonsillotome lest the pillar of the fauces be wounded and hæmorrhage follow. Amygdalotomy and not amygdalectomy, partial rather than complete excision is advised. Deroubaix¹⁹ claims that but little more than the projecting portion need be removed. Seiler²⁰ says that "total ex-

tirpation or enucleation is also dangerous besides being unnecessary, except in the extremely rare cases of cancerous growth in the tonsils." Prosser James²¹ remarks that a small portion sliced off is an effectual remedy, as the remainder of the tonsil shrinks within the pillar and the cure is complete! Philip Schech²² claims that removal of the whole tonsil is unnecessary and dangerous; only the projecting part should be removed. Yet he admits the danger of wounding the carotid does not exist if the tonsillotome be used. Sir Morell Mackenzie²³ advocates partial removal, and Cohen²⁴ says that excision of the entire gland is "hardly ever requisite." He prefers the knife in adults, the amygdalotome in children. On the other hand, Lennox Browne²⁵ always endeavors to remove "as much of the gland as can be pressed into the guillotine," and does not look for atrophy of the rest. Bosworth²⁶ asserts that the "whole organ should be removed if possible in all cases." Examination of a large number of cases supports the belief that the stump of an excised tonsil does not, as a rule, shrink to an appreciable degree, but on the contrary remains as a source of irritation and is prone to recurrences of inflammation. In the second place, it is almost impossible to wound the pillar with a properly constructed guillotine, and, if that accident should happen, hæmorrhage, except under most extraordinary circumstances, could not be serious. Finally, and this is a point of no little moment, as much of the tonsil as possible should be removed, for the reason that deep section of the blood vessels through normal tissue permits them to contract so that spontaneous control of hæmorrhage is much more likely to occur. We can therefore accomplish a satisfactory excision of a tonsil only by strong outward pressure with the tonsillotome against firm support from without furnished by the hand of an assistant. As Mackenzie has remarked, this operation is almost the only one in our department requiring the exercise of brute force. There are two reasons, therefore, for making the extirpation of the tonsil as radical as possible: 1. Tendency to recrudescence is lessened; and 2, danger of hæmorrhage is diminished.

In conclusion, there are two points in connection with this subject which seem to me worthy of attention. One relates to the selection of an instrument, and the other to the use of anæsthesia. There seems to me no question that Mackenzie's modification of Physick's well-known guillotine is incomparably superior to all other instruments. Such accidents as have been reported by Schuler²⁷ and Barré²⁸ with the Mathieu tonsillotome could hardly happen with the Mackenzie instrument. The addition of a fork to the guillotine not only complicates the operation but adds to the difficulty of keeping the instrument aseptic. If properly managed the Mackenzie

tonsillotome will cut only the tonsil and in suitable cases it will remove as much of the organ as may be desired. This instrument commends itself, therefore, because of its strength, its simplicity, its safety, and its effectiveness.

There no doubt exists some prejudice against the use of an anæsthetic in removing tonsils. In the course of a discussion at the Paris Surgical Society, Reclus²⁹ referred to an unpublished case of fatal asphyxia during a tonsillotomy under chloroform. Avoid profound anæsthesia, remove the tonsils in quick succession, immediately turn the patient upon the face, and such a misadventure cannot occur. Some years ago Ingals³⁰ remarked that removal of the tonsils is as serious a matter for a child as it would be for an adult to be hung. In young children, therefore, we should use ether or chloroform, not only to obviate mental and physical suffering, but, what is much more important, in order to enable us to explore the naso-pharynx at leisure, and if necessary to remove from that region those collections of lymphoid hypertrophy so often associated with similar overgrowths between the palatine folds.

20 W. 31st street.

LOCAL ANÆSTHESIA WITH THE PHARYNGEAL COCAINE SYRINGE.

Read by Title in the Section of Laryngology and Otology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY JNO. E. BOYLAN, M.D.,

OF CINCINNATI.

Mr. Chairman and Gentlemen:—I had occasion to report last year, at Nashville, a method of effectually anæsthetizing the tissue of the vault of the pharynx before operating upon adenoid vegetations, by the interstitial injection of cocaine with a suitably constructed and guarded needle syringe.

I wish to-day to make a brief report of observations with the instrument during the past year, and as it was incomplete when exhibited, and has since been somewhat modified, I take the liberty of producing it again. An objection raised to the use of the instrument, which was otherwise kindly criticized at the time, was the danger of calling forth alarming or even fatal symptoms by subcutaneous injections of cocaine.

Dangerous and disastrous results from the use of cocaine as a local anæsthetic was, from the start, the bugbear that stalked at the heels of this brilliant and most happy innovation, as it was upon the introduction of the general anæsthetics, chloroform and ether; and yet I should like to ask how many of the gentlemen present have found this objection a sufficiently grave one to have prompted them to desist from its use? Though we occasionally hear the note of warning, and here and there a fatal case has been reported, their proportion has not increased with the prevalence of the drug, while its use has become so universal, among the specialists particularly, that it is to be doubted if there are many of the latter who could now be induced to do without it. With the report of fatal cases we are almost invariably informed of the size of the dose administered, and I have yet to hear of a single one which was not much larger than necessary to produce satisfactory local anæsthesia.

Aside from the repeated applications to the mucous membrane of the nose and throat, made almost daily over a period of about four years, I have, since May last, injected cocaine into the tissue at the vault of the pharynx of thirty-seven different patients. I have never failed to make a note of cases in which symptoms other than local anæsthesia were manifested, and of these there are nine all told. In five of the nine cases, toxic or constitutional symptoms, such as hilarity, pallor, somewhat labored respiration or tendency to syncope, occurred after the application of about 30 m. of a 20 per cent. solution with a brush. The remaining four cases occurred after hypodermic injection, and as follows: The first three happened among the first ten cases treated, and following an injection of 20 m. of a 10 per cent. solution, or about 2 m. of cocaine, while the fourth was the only one which occurred among the last twenty-seven cases, after reducing the injections to 15 m. of the same solution, to which quantity they have since been confined. In only one of all the cases were the symptoms at all alarming. In this instance the patient was a robust boy 15 years of age, and the dose, which was injected with the syringe, was possibly a little more than 20 m. Within two minutes the patient became pale, and stated that he was growing numb and dizzy. He stamped about for a few minutes, slapping his hands and legs, which seemed to be rigid with cramp; his respiration

¹ Medical Times and Gazette, May 1859, p. 517.

² Anatom. Anzeiger, 1889, No. 15, p. 467.

³ American Journal Medical Sciences, March 1891, p. 257.

⁴ Medical Record, New York, April 3, 1891.

⁵ Transactions American Laryngological Association, vol. xi, 1889, p. 78. Note on the Galvano-Cautery in the treatment of Hypertrophied Tonsils, by Chas. H. Knight, M.D.

⁶ Diseases of the Throat and Nasal Passages, 2 ed., p. 233.

⁷ Arch. Méd. Belges, 1878, from Jour. de Méd. et de Chi. Prat. No. 12, 1878.

⁸ London Lancet, 1882, p. 798.

⁹ Cohen, Diseases of the Throat, &c., p. 233.

¹⁰ Diseases of the Throat and Nose, 1880, p. 68.

¹¹ Ann. d. mal. de l'oreille, du larynx, &c., July 1880, p. 63; 1881, p. 124.

¹² Ranking's Abstracts, 1862, p. 240.

¹³ Presse Méd. Belges, No. 10, 1862.

¹⁴ Gaz. Med. Ital. Prov. Sard., Dec. 30, 1861.

¹⁵ British Medical Journal, March 1884, p. 602.

¹⁶ Journal American Medical Association, vol. i., No. 1.

¹⁷ New York Medical Journal, Aug. 30, 1890.

¹⁸ Balme, De l'Hypertrophie des Amygdales, 1888.

¹⁹ Presse Méd. Belges, Nos. 31 and 38, 1863.

²⁰ Diseases of the Throat, 3 ed., 1889, p. 247.

²¹ Sore Throat, 4 ed., 1879, p. 240.

²² Die Krankh. der Mundh., des Rachens und der Nase, 1890,

p. 151.

²³ Arch. of Laryngol., vol. iv, 1883, p. 145.

²⁴ Op. Cit., p. 229.

²⁵ Diseases of the Throat, 3 ed., p. 255.

²⁶ Diseases of the Throat and Nose, 1881, p. 141.

²⁷ British Medical Journal, March 12, 1887.

²⁸ Union Méd., No. 48, 1886.

²⁹ Journal of Laryngology and Rhinology, 1887, p. 231.

³⁰ Transactions American Laryng. Association, 1887, p. 178.

became labored, the dizziness increased, and he insisted upon lying down to sleep. Some whisky, a current of fresh air from the open window, and friction, gradually rallied him from this condition, and within twenty to thirty minutes he was completely restored. A week later, an injection of exactly 15 m. into the same patient was followed by but slight pallor and somewhat accelerated respiration, which did not impede the operation.

As the result of the above, as yet, rather limited observations, I infer that the amount injected should be about one-half that which may be applied to the mucous membrane. I believe a 20 per cent. solution a perfectly safe quantity to inject, and I have never known such a case to fail in producing within five minutes entirely satisfactory anæsthesia, so that the patient never complained of pain from the operation.

The chief points of advantage which may be claimed for this method of anæsthetization are, that it greatly reduces the percentage of cases in which a general anæsthetic must be resorted to by effectually benumbing the part; 2, the ease and celerity with which it is accomplished, for it is done in an instant, and regardless of the ordinary retraction of the palate, the guarded point being quickly inserted between the latter and the laryngeal wall, if necessary; 3, the rapidity and completeness of its effect; and 4, the fact that cocaine is swallowed or retained in the nose, which does not assist in producing anæsthesia in the pharynx. As obstructions of the lumen of the needle necessitated various trips to the instrument makers, this has been made to screw to the handle, and can easily be detached with a forceps and cleaned. The instrument is made by Tien & Co., of New York, and by Max Woche of Cincinnati.

ABSTRACT OF PAPER ON CHRONIC CATARRHAL LARYNGITIS.

by Title in the Section of Laryngology and Otology, at the Twenty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY MARION THRASHER, M.D.,
OF SAN FRANCISCO, CAL.

Chronic catarrhal laryngitis is a continuous active inflammation of the laryngeal mucous membrane. Its etiology is multifarious. The most influential causes are nasal stenosis, liquor drinking, tobacco smoking, vitiated air, and an immoderate use of the vocal organs. Nasal stenosis necessitates mouth breathing—abnormal respiration, by which we have carried into the laryngeal cavity an air pregnant with dust, that soon begets an inflammatory process.

Chronic alcoholism produces an abnormal action of the mucous glands of the mouth and

fauces, which, during sleep, drops depraved excretions into the larynx, thereby producing a permanent inflammation.

Tobacco smoking causes to be deposited daily in the air passages the liquid alkaloid nicotina, which produces partial paralysis of the vasomotor nerves of this locality, and a resultant permanent injury to the mucous texture.

Vitiated air, in illy ventilated apartments, is one of the commonest causes of chronic laryngitis. Air reeking with noxious vapors poisons the delicate tissues over which it passes, fails in its mission of aerating the blood, and by its toxic reaction, superinduces a chronic hyperæmia of the respiratory tubes.

An immoderate use of the vocal organs in criers, speakers and singers, must of necessity produce chronic laryngitis. Mandl says, in singers and orators, the arytenoids and vocal cords are inflamed, while in drinkers and smokers, the inflammation exists in the epiglottis and aryglottic folds.

The pathological condition is always one of hypertrophy of the mucous membrane of the larynx. This is a diagnostic symptom, and is accompanied by all or part of the following symptoms: difficult nasal respiration, morning hoarseness, decreasing with the day, cough, dysphagia, copious secretion and excretion, supplemented always by a feeling of uneasiness or discomfort—but by an absence of positive pain.

The prognosis of chronic laryngitis is favorable as to fatality, but usually unfavorable as to a permanent cure. For years, extending to a long lifetime, it may continue, with remissions and exacerbations, and not perceptibly affecting the general health. The difficulty in the way of a permanent cure, lies in a failure in keeping up a given line of treatment for a sufficient length of time. Both physician and patient may at first be enthusiastic, but as days, weeks and months go by, the enthusiasm wanes, the treatment is neglected or wholly ignored—or perchance a temporary abatement of the prominent symptoms had led them into the belief that a cure had been accomplished. We should not forget to impress upon the mind of the patient and his friends, that a chronic disease can only be successfully combated by chronic treatment.

The pathological factor is hyperæmia. The chronic inflammation of the laryngeal membrane has produced a permanent distension of the capillaries—oversecretion and supersensitiveness.

The treatment may be local, general, or both—guided by the etiology. No less an authority than Lennox Browne claims but little for constitutional treatment. The experience of most physicians will not agree with his. The treatment may properly be local, constitutional, or both. The exciting cause must be discovered and overcome. The diagnosis can readily be made with

the laryngeal mirror. If the etiology points to portal congestion, chloral hydrate would be indicated; if a syphilitic taint, mercury; if tuberculosis, iron and cod-liver oil; if glandular enlargement, one of the iodides. The necessity of constantly breathing pure air cannot be too strongly dwelt upon. Let the diet be light, digestible and nutritious. The plethora of glutony should be guarded against. For the treatment of chronic laryngitis, I know of no one remedy so efficient as alcohol. Unlike many others, it is applicable in all cases, irrespective of cause. It is a local and constitutional tonic, acting not only beneficially on the lining membrane of the air passages, but also as a systemic stimulant.

Nasal stenosis is reduced, and as a rule permanently cured, by alcoholic inhalation. Pharyngitis is relieved, and the uvula—usually elongated in laryngitis—is rendered normal. Several cases of tuberculosis, well advanced, have been checked, in my practice, by alcoholic inspiration. Wearing a full beard among men, has been strongly recommended by some medical writers as a remedy, both curative and preventive, for chronic laryngitis.

A thermometrical sameness, secured either by latitude, altitude or artificial methods, must not be overlooked, as one of the most potential of the remedial agents—but by all means, let your treatment be measured by months rather than days.

THE GALVANO-CAUTERY IN LARYNGOLOGY, WITH CASES.

BY GEO. W. WEBSTER, M.D.,

OF CHICAGO, ILL.
PROFESSOR OF PHYSIOLOGY CHICAGO MEDICAL COLLEGE.

The object of this paper is to produce evidence tending to show that the galvano-cautery, and especially the snare, is a decided addition to the armamentarium of the laryngologist, and the method entitled to legitimate recognition. As a rule it is condemned most loudly by those who have used it the least, basing objections on theoretical grounds, and in most instances the objections urged are, it seems to me, not well sustained by the facts, nor by personal experience.

The variety of cases in which I have used the cautery in laryngology with advantage, are hypertrophy of the tonsils, cancer of the œsophagus with growth protruding into the larynx, papilloma of the larynx and abscess of the larynx.

In regard to the cautery in removal of the tonsils, I have used this method for three years, and *no other method* for two years. In using the galvano-cautery it is of prime importance that we have a handle so made as to allow the operator to make or break the current at will, and to at the same time operate the windlass with the

thumb. The Flemming handle, or some of its modifications, is the instrument preferred by the writer. It is equally important to have a current that will heat the wire quickly and at the same time be controlled by a rheostat. Platinum wire is the only material that can possibly give satisfaction; and some form of storage battery will be found most serviceable.

In removal of the tonsils it seems to possess the following advantages:

1. Consent of the patient, as there is neither cutting nor hæmorrhage.

2. Absolutely no primary hæmorrhage, though the probability of secondary hæmorrhage is probably not lessened.

3. Greater facility of application, especially small hypertrophies, and in many children with small throats, where an instrument of larger size could not be easily applied.

4. Better results because of lessened tendency to return, and less absorption after the operation.

5. In large hard hypertrophies where hæmorrhage is feared and where the cold snare is recommended by some writers.

Some form of tonsil forceps is always needed as aid in raising the tonsil from its bed. The forceps of Fanenger and of Ingals I have found to be most convenient and valuable.

In using this method in public and in private practice in about one hundred and fifty cases, I have had no unpleasant results, and only one case of slight secondary hæmorrhage.

In the removal of growths from the larynx the cautery has the following advantages:

1. Perfect safety, as the current is *never* turned on until the growth has been firmly grasped by the loop.

2. A small instrument which when in the larynx allows one to obtain a more perfect view of the parts, thus facilitating greater accuracy.

3. Absolutely no hæmorrhage, thus allowing growths to be removed piecemeal at one sitting, which could not be done by any other method where hæmorrhage obscures vision.

4. In papilloma of the larynx where the base is thus cauterized there is, I believe, less liability to recurrence.

I would not be understood as advocating this method to the exclusion of others, nor as even estimating that it is applicable to all cases, though where any growth can be grasped by the loop I believe it to be the best method.

Case 1.—Miss O., 26 years of age, saleslady, occupation, general health good, consulted me three years ago for laryngitis. At that time there was an acute inflammation and the membrane in the inter-arytenoid space was thickened and showing some rugæ when patient pronounced.

Consulted me again May 25, 1891. At that time the patient could only whisper and she

med me that she had not been able to speak and for several weeks, and that for over a year she had been always hoarse and much of the time completely aphonic, and that she is growing constantly worse notwithstanding almost constant treatment by various physicians. She says there is no pain in or about the throat, but complains of a tired feeling after attempted speaking. There was no swelling of the glands on the outside of the neck.

Family history reveals the fact that one sister died of pulmonary tuberculosis. Patient is large, strong, well nourished and has normal temperature.

Laryngoscope examination shows a general acute laryngitis, and also reveals a rough, irregular growth of a slightly opalescent color apparently very nodular and occupying the inter-tenoid space, and being separated into two lobes by a perpendicular fissure. It was almost half inch in length from above downward and smaller in a transverse direction, and by its size and location mechanically prevented the approximation of the vocal cords by contraction of the tenoid muscle, thus rendering phonation impossible. I informed the patient that I had never seen such a growth in that location, but supposed it was papilloma, but that a positive diagnosis could be made only by a microscopical examination, or noting whether the growth receded, and advised removal. This was consented to and the galvano-cautery was the method chosen.

After a thorough application of cocaine (10 per cent. solution) I passed the loop into the larynx and after a few moments of patient manœuvering succeeded in getting the loop firmly around it, and it was quickly removed without pain or hemorrhage. On inspection I was not quite satisfied with the appearance of the base, so I introduced another form of electrode and cauterized more completely the surface from which the growth had been removed. After the operation was completed the patient could speak but was somewhat hoarse.

Unfortunately, just as I was removing the growth from the mouth the growth became detached and fell into a jar containing some blood, several drops of water and masses of adenoid vegetation were removed, and I was therefore unable to see and examine the specimen.

The treatment after the operation consisted in rest of the voice for one week. Morphæ gr. one-thirtieth the first night. Locally, iodoform in benzoline 10 per cent. applied once each day on cotton on applicator.

There was a little increase in inflammation on the day of the operation, but on the second day inflammation had decreased and from that time on the improvement was rapid and the patient began work as saleslady at the end of the

week, although I objected to her doing so. The second week I applied each day a spray of silver nitrate, 15 gr. to the ounce; the third week the same solution every second day.

The inflammation has now quite disappeared, the voice is as good as ever in her life and she is able to sing fairly well and that for the first time in nearly four years. Of course it is too early in the case to make a diagnosis, for it may have been tuberculous papilloma; but no one will deny, although all do not appreciate fully the value of radical treatment in these cases, and this is especially true if they are tubercular.

Case 2.—Mr. X., laborer, about 28 years of age, strong, robust young man, was sent to me last winter by Dr. Frank Cary. History of severe cold and sore throat.

Laryngoscope examination showed large abscess of the larynx. After applying cocaine, I evacuated with guarded lancet; considerable choking and coughing. Next day the abscess had refilled. I then introduced a cautery electrode in the place of former puncture and thus formed a round opening with some destruction of tissue, hoping thereby to facilitate drainage. I then washed out thoroughly with peroxide of hydrogen. There was no further refilling and the patient made a rapid recovery.

Case 3.—Mr. W., 50 years of age, small stature, emaciated, consulted me in October, 1890, on account of difficult deglutition. He informed me that he had experienced an increasing difficulty in swallowing, and at that time it required constant effort for over an hour to swallow a cup of coffee, and that no solid food had been taken for several weeks. He said he must get relief very soon or else die of starvation, and his appearance justified the statement.

Inspection of the outside of the throat revealed the fact that in the act of deglutition the larynx did not ascend to the normal extent, and that it seemed bound down and was less freely movable than normal. There was no infiltration of glandular structures in the neighborhood. The patient was free from pain and the family history was good.

On making a laryngoscopic examination, a large lobulated growth of a whitish opalescent appearance was seen apparently springing from the œsophageal opening, and acting as a valve, while one of the larger lobes projected forward, between the arytenoids, and appearing to prevent the epiglottis from closing the larynx completely in deglutition, and seemed to explain why the fluids, as he expresses it, "went the wrong way" and "choked him."

I applied a 10 per cent. solution of cocaine to the entire larynx and, after about six minutes, made a more thorough examination with the probe, and found the growth to spring from the posterior wall of the œsophagus, immediately be-

hind the larynx. Thinking that possibly the growth, by its size and location, mechanically prevented the entrance of food, I determined to remove it. This I had no difficulty in accomplishing, using the galvano-cautery snare, removing it in four pieces, there being neither pain nor hæmorrhage during the operation. There was no reaction of any consequence subsequently. On attempting to pass a bougie into the œsophagus, I found a stricture at the upper part, although deglutition had been somewhat facilitated by the removal of the growth.

Microscopic examination revealed the fact that the growth was a ring-shaped carcinoma. After this time I dilated the stricture about every five days and twice each day I passed the stomach tube, giving the patient each time nearly a quart of milk, together with two eggs. Sometimes peptones were added instead of eggs, and for the last two months an ounce of brandy was given with each feeding, at the patient's request. For a short time the patient gained somewhat in weight, and quite materially in strength, going about the city freely and seemingly happy, and he said free from pain. At home he took some coffee and occasionally a little soup or broth. This treatment was continued for several months, when the patient died.

One interesting and troublesome feature of the case might be mentioned. From first to last it was impossible to introduce the stomach tube without the aid of the laryngoscope, thus necessitating personal care of the patient.

There was no return of the growth in the laryngeal cavity but the extension was downward.

70 State Street.

FRACTURE OF THE THYROID CARTILAGE.

BY GEORGE L. MORGENTHAU, M.D.,

OF CHICAGO.

ASSISTANT AT PROFESSOR SCHNITZLER'S POLICLINIC FOR DISEASES OF THE THROAT AND CHEST, VIENNA.

Since Arbuthnot Lane¹ (1885) drew the attention of the profession to the frequency of fractures of the hyoid bone and larynx, several cases have been reported which tend to confirm his statement, that these fractures sometimes produce such light symptoms that they can be overlooked. Formerly, the prognosis was considered much graver. Gurlt² had (in 1864) collected 68 cases, of which 47 ended fatally, and only 21 recovered. Even excluding those in which the injury was caused by an attempt on the patient's life, or where some additional accident complicated matters, 21 died, and but 13 recovered. Fischer³ pronounces every

fracture of the larynx serious. Later observers however, contributed statistics which are more encouraging. The most recent publication, by Sakolowski,⁴ describes a severe case with recovery. In it will be found a summary of the literature on the subject, statistics, etc. Although the case had occasion to observe is an uncomplicated one, or rather because it shows how exceedingly light the symptoms resulting from a fracture of the thyroid cartilage can be, I think it worthy of publication.

The patient, a fairly intelligent, robust artisan of about 40, came to Professor Schnitzler's department in the Wiener Allgemeine Poliklinik on account of hoarseness. On being questioned how long this had troubled him, he said that some three months ago, while bending over a balustrade, he was struck on the back of the head by a descending, heavily loaded elevator. His neck was pressed between the lift and the bar. He was immediately attacked by a coughing spell, expectorated a little pure blood, and became aphonic. There was no pain, but the swelling about the neck induced him to go home and make applications. The next day he could go to work again, hoarseness being the only reminder of yesterday's accident. It was the hoarseness on account of which he came to the Poliklinik, not having found it necessary to consult any physician meanwhile.

While inspection revealed nothing abnormal in the anterior part of the neck, upon applying the finger to the angle of the thyroid cartilage, the left ala receded. By rubbing the two fragments together, distinct crepitus could be heard and felt. Further palpation showed that the left wing of the thyroid cartilage was fractured longitudinally, the line being slightly irregular, and about $\frac{1}{8}$ of an inch from the angle of the cartilage. All other parts, especially the hyoid bone and cricoid cartilage, were examined carefully, but appeared unharmed. The condition of the interior of the larynx was as follows: The epiglottis was omega-shaped, slightly overhanging. Both ventricular bands were much swollen, but did not look angry. The vocal cords could not be seen. Even in phonation, only a little portion of the posterior ends could be perceived. During the act of phonation the ventricular bands approximated, apparently producing the hoarse voice. An accurate opinion of the lesions in the larynx cannot be formed. The mucous membrane must have been lacerated, since the accident was immediately followed by hæmoptysis. The rent in the membrane, however, could not have been long or deep, or emphysema would have set in. According to statistics, there is emphysema in most of the cases, sometimes extending to the extremities. Possibly, also, the anterior attachment of the vo-

¹ Arbuthnot Lane, British Med. Journal, March, 1885.

² Gurlt, Handbuch der Lehre von den Knochenbrüchen, ii Teil, 1864.

³ Fischer, Deutsche Chirurgie, Lief. 34.

⁴ Sakolowski, Berl. Klin. Woch., No. 40, 1890.

cords was severed, and they could not be seen because they could not contract, not only because they were hidden by the ventricular bands. Another interesting question (also from a medico-legal point of view in cases of assault), is why, in this case, the line of fracture was vertical, and in or near the centre. Gurlt's experiments demonstrate that vertical fractures are possible when the larynx is compressed antero-posteriorly, as in this case. Possibly, ossification in the cartilaginous tissue had advanced to just the line of fracture. And the absence of the youthful elasticity—due in turn to the deposit of bony matter—is a predisposing moment (Hoffmann⁵). To be sure, the elasticity is not so great as to protect the larynx against every injury by external force. Figures show that youthful individuals are not at all immune against fracture of the larynx, although partial ossification predisposes to injuries. As this patient is over 40 years, ossification has undoubtedly begun. According to Patenko's⁶ observations, the elasticity is not diminished before the thirtieth year, and ossification varies very much, also, in regard to the region where it commences, and to its extension. Another explanation applicable in the present case is offered by Gurlt. When the line of fracture is to one side, this might be due to the suture which is formed by the ala of the thyroid and a narrow, thin cartilage sometimes found between the two wings.

The only indication in this case, at the time the patient came to the Policlinic, might have been the alleviation of the hoarseness. The fracture caused him no inconvenience excepting the hoarseness, which did not hinder him in his work. We could not, therefore, in conscience advise him to undergo an operation, although the case might be considered well adapted for sutures. There was no vestige, here, of the formation of a bony callus after three months, though Lane demonstrated a specimen in which bony union had taken place. Perhaps the increased irritation by the wire sutures might have proved a favorable factor in bringing about such a result. Even fibrous union would justify an operation in some cases. As to the advisability of using sutures, the opinions of surgeons are divided. Fischer reports that all kinds of wounds and injuries in the upper air passages have healed as well without sutures as with them.

Generally, tracheotomy has been performed when the surgeon was called in shortly after the accident. Threatening dyspnoea will make this operation necessary in the majority of cases. Besides, in fracture of the cricoid cartilage, the canula tends to immobilize the fragments (Clarac⁷). Both indications might be met, in fracture

of the thyroid cartilage, by O'Dwyer's permanent tubes. Intubation ought certainly to be tried in appropriate instances. Adaptation of the fragments will often present great difficulties, either when done from without through the tracheotomy wound or an incision, or possibly from above by aid of forceps. Complete rest, ice-bags on the wound, and vapors, are certainly of great benefit. The case described proves that tracheotomy is not always necessary. After only a day's rest the patient returned to work, without ever experiencing pain, or any inconvenience excepting hoarseness.

Vienna, July 1, 1891.

A BRIEF COMMUNICATION ON NASAL VIBRATION (MASSAGE) WITH REPORT OF CASES.

BY NORVAL H. PIERCE, M.D.,
OF LONDON, ENG.

At the Tenth International Medical Congress a paper was read before the Laryngological Section, which at once attracted attention, first, because it sought to introduce a novelty into our therapeutics; secondly, because it had for its scope and promise the cure of a class of diseases which have been regarded as nearly or altogether incurable. I refer to Dr. Brown's paper on Vibratory Massage of the Nose,¹ etc.

In order to refresh the memory of the reader I will take the liberty of presenting an extract translation of the above mentioned contribution.

The two massage movements employed are known according to Dr. Kellgrew (London) as *effleurage* and *vibration*.

By *effleurage* is meant a *stroking* movement superficial or deep, the force of which varies from a scarcely perceptible touch to distinct pressure.

By *vibration* is meant a light, rapid trembling movement, having its origin in the elbow joint and which is transmitted by the palmer ends of the fingers to the point of operation. The motions occurring in the relaxed wrist joint are abduction and adduction, while the hand itself remains in uninterrupted contact with the surface operated upon. The whole procedure is characterized by a lightness, rapidity, and elasticity of touch. The number of vibratory movements varies from 200 to 300 per minute.

In order to apply this treatment to the nasal cavities, a copper sound is necessary. The one recommended measures twenty cm. in length, and has a diameter at the larger end of two mm. The end which is introduced into the nose is finished with a ribbed head to which cotton may be attached. This cotton may be immersed in

⁵ Hoffmann, Wiener Med. Woch., Nos. 44 and 45, 1886.

⁶ Patenko, Vierteljahrschr. f. gerichtl. Med. von Föhlenberg, Bd. xli.

⁷ Clarac, Gaz. des Hôp., September, 1890. (Int. Centralbl. f. Laryngologie, etc.)

¹ Massage, beziehungsweise, Vibrationen, der Schleimhaut der Nase, der Nasenrachenraums und des Rachens. Dr. Michael Braun, Triest, Oestreich.

various medicinal solutions hereafter to be specified. The sound is held in the hand like a pen—i. e., between the thumb and first and second fingers—and the vibrations carried on as above described.

First, the floor of the nose is vibrated, then the inferior meatus and turbinated body, then the middle and superior, along their entire length, after which comes the septum. The Eustachian prominence may also be treated in the same manner, as well as the orifice of the Eustachian tube itself.

The number of fresh sounds used in a single case varies. In a late letter which I received from the author he says that he uses as many as twenty in one séance.

Strict cleanliness must be observed; all encrustations and discharge must be carefully removed and the vibrations carried to every part of the nose that is reachable. The vibrations last from one-half to sixty seconds, according to the patient's power of resistance.

Various solutions are recommended to be used in connection with the treatment. If there is hypersensitiveness the nasal mucous membrane is first painted over with a 20 per cent. cocaine solution. Subsequently the following medicaments may be used: 10 per cent. menthol vasaline ointment, 10 per cent. iodo-glycerine (iodine 1.00, kalium iodid. 1.00, glycerine 10). Sublimat (1 pro mil), lanolin, vasaline, balsam of Peru.

Dr. Brown has treated 1,000 patients by this method of treatment, and the most various nasal pharyngeal and laryngeal diseases have been comprised within this number. Perhaps the most striking results were obtained, it is said, in foetid atrophic rhinitis. The disease very soon loses its foetor, and the mucous membrane is restored to its normal condition, while the *atrophic turbinated bodies return to their normal proportions*.

In order to test the efficacy of this therapeutic mode, six cases of foetid atrophic rhinitis were selected from Dr. Ottocar Chiari's ambulatorium at the K. K. Algancinca Krankhenhaus in Vienna, and placed under my care. These cases were carefully and conscientiously treated every day, with the exception of Sundays and holidays, for two months. At the end of that time I was called away by other duties, but the treatment was carried on for two more months. The directions given by Dr. Brown were carefully observed. Before the vibrations were commenced each patient received a thorough nasal douche or bath of one-half per cent. carbolic acid sol. and the nose was carefully inspected to see if any secretion or crusts remained. If so they were removed by the dry pledgit. The cotton with which each vibration was carried on was first

immersed in iodo-glycerine sol.; each séance lasted from twenty to sixty seconds.

Following is a brief summary of the cases with the results obtained:

March 2, 1891.—C. S. aged 29. The patient came to the ambulatorium in the middle of September, 1891. She was then suffering from advanced atrophy of both inferior turbinated bodies, accompanied by profuse secretion and formation of foetid crusts. For two months from entrance the patient received a daily douche of one-half per cent. salt solution, and the nasal mucous membrane was painted with iodo-glycerine, which treatment was followed by a decrease in the amount of secretion. The vibrations have been carried forward since the middle of October. The patient says the discharge from the nose is much improved, but we can see no change in the atrophic condition.

M. P. aged 26. Patient complains that for three years a disagreeable odor has tainted her breath, and that she has had a profuse nasal discharge. Inspection disclosed marked atrophy of the lower turbinated body of the left side, and formation of crusts. Since the middle of November the patient has had nasal douche three times daily, and once a day penciling with iodo-glycerine. Under this treatment the foetor diminished, together with the crusts, but the secretion was never altogether absent. Since November the vibrations have been employed. At this time the secretion is very slight in quantity, but there is no appreciable improvement in the atrophy.

S. A. aged 23 years. Patient has been treated since September with nasal douche and iodo-glycerine. She suffers from advanced atrophy of both inferior turbinated bodies; the right is the more advanced. Foul smelling crusts are also present. Vibrations since November. The secretion is improved more under this treatment than under previous method. Atrophy unchanged.

C. P. æt. 15. Patient has been a year at the clinic suffering from rhinitis atrophica. The inferior turbinated bodies entirely disappeared, and only a small portion of the middle ones remain. There is foetor, profuse secretion and formation of crusts. The treatment has been nasal douches and penciling with iodo-glycerine until November, 1890, when vibrations were commenced. The odor and crusts formation have disappeared. The atrophy, however, is unchanged.

M. L. æt. 14. Patient has been coming to the ambulatorium for a year. There is atrophy of left lower and middle turbinated bodies, much secretion, crusts and odor. Before commencing the vibrations the treatment was much the same as that employed in the other cases, but the former has not proved superior to the latter. The atrophy is unimproved.

N. A. æt. 20. Patient complains of having

had a disagreeable odor from the nose for a long time. Inspection shows atrophic rhinitis. Patient has taken nasal baths at home for some time. Came to clinic in January, 1891. The vibrations in this case were followed by entire disappearance of the fœtor and diminution of secretion, but the atrophy remains unchanged.

From these cases and results we may draw the following conclusions:

First—To the cleanliness which is made so essential in this mode of treatment, are due most of the speedy cures or reliefs of disagreeable symptoms, i. e., fœtor, secretion, etc.

Second.—The vibratory movements themselves may be indeed of some benefit, inasmuch as they are stimulating to the lymphatic and vascular system, but

Thirdly we must believe from the above results that the vibrations have little or no action in regenerating atrophic tissue.

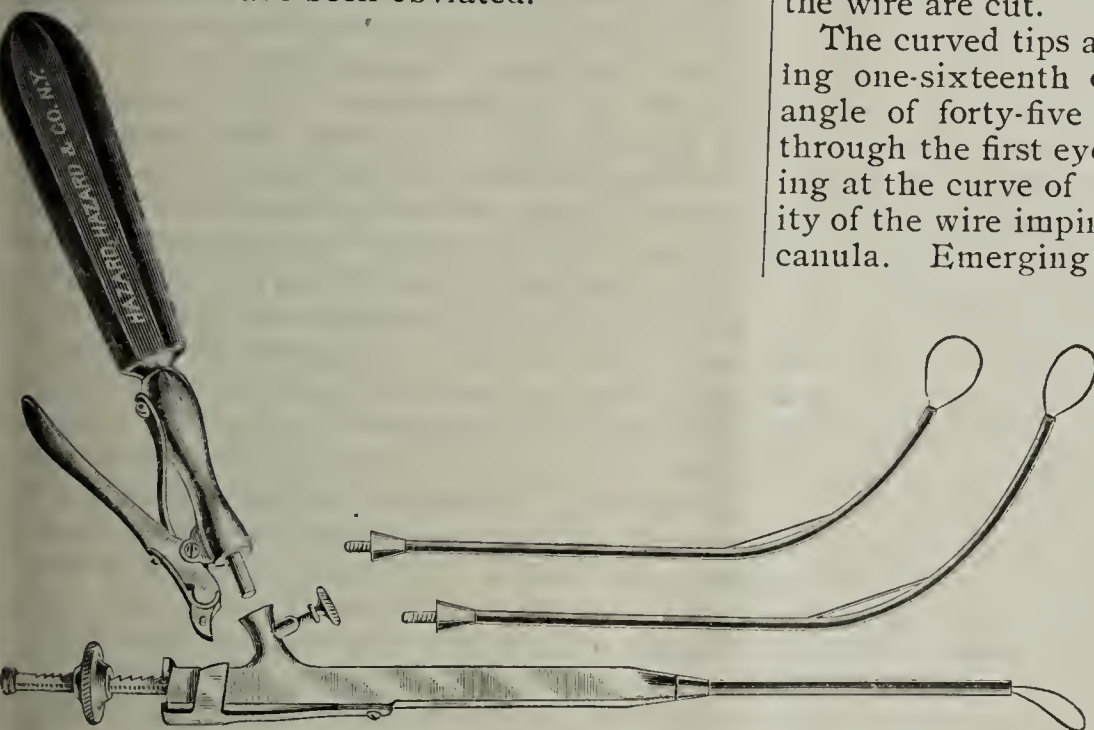
In conclusion I have to express my sincere gratitude to that eminent teacher, Dr. Ottocan Chiari, for his permission to publish these results as well as for many other kindnesses.

London, April 22d, 1891.

A NEW UNIVERSAL DOUBLE-ACTING SNARE.

BY CHARLES A. BUCKLIN, A.M., M.D.,
OF NEW YORK.

The good principles of all similar instruments have been combined in this snare, and their inherent defects have been obviated.



The wire is attached to a solid stylet, the obstructions to which are overcome by the powerful ratchet motion which draws it. A screw motion is also attached to the same stylet, thus enabling the operator to use a very slow-cutting snare, where hæmorrhage is feared, while the ratchet

motion provides a rapid-cutting one where there is no reason to expect hæmorrhage.

The handle and ratchet motion may be detached at pleasure, leaving an instrument suitable for the slow strangulation of a very vascular growth.

The instrument has a straight tip for the nose and curved tips for reaching the larynx and naso-pharynx through the pharynx.

In curved canulas all attempts to use flexible stylets under severe traction are dangerous, as they must break sooner or later in making the transit of the curve.

With this wire écraseur every benign neoplasm or hypertrophy found in the nose, naso-pharynx or pharynx can be removed at a single sitting in a manner which commands the approval of the most conservative operator.

This instrument also fully meets all the requirements met by Stoerks' laryngeal guillotine or wire écraseur, and furnishes one not provided with laryngeal forceps with a simple and effective means of extracting many foreign bodies which lodge in and about the larynx.

If the instrument is firmly secured at the detaching joint, the wire properly fastened, and the clearances of the ratchet under-strain are $\frac{1}{2}$ of an inch, it will never fail to cut any growth the loop embraces.

The straight canula is armed with wire by passing it through the eyes of the slightly projecting stylet from opposite sides. The required loop having been formed, the stylet is drawn by the ratchet motion, and the projecting ends of the wire are cut.

The curved tips are armed with wire by bending one-sixteenth of an inch of the end at an angle of forty-five degrees. It is then passed through the first eye of the stylet into the opening at the curve of the canula, with the convexity of the wire impinging on the concavity of the canula. Emerging sufficiently to form a loop, it is returned through the curved canula, with its convexity impinging on the concave surface of the canula. When the wire appears at the opening, it is twisted until the bent point is opposite the second eye in the stylet, which it will enter easily, and the loop is complete.

By the pressure of the thumb on the tip of the instrument, the wire loop, after having been drawn, can be returned instantly to position for further operation through any of the tips.

For further particulars and history of steel wire snares, see *New York Medical Record*, July 4, 1891.

THE STERILIZATION OF MILK AND THE STATUS OF OUR KNOWLEDGE UPON THIS SUBJECT.

Read in the Section of Diseases of Children at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY HENRY KOPLIK, M.D.,
OF NEW YORK.

In presenting this subject, I feel that I am going over ground well elaborated before me, yet even in the face of this, it is somewhat surprising to find the lack of systematic idea entertained by physicians upon the subject of milk or its sterilization. This most important innovation upon infant feeding has, even in our journals, been granted faint praise in occasional paragraphs.

Though the work done thus far in this field has been most painstaking and scientific, it has not fully reached those for whose benefit these investigations are mostly undertaken,—the medical public. There are scattered through the French and German literature some very classical articles upon this subject, but no English writer has of late attempted to systematize and classify the ideas presented. If this article will deal with some scientific and abstruse data, it will endeavor to bring these in direct relation with our daily practice and therapy. For a long period past, the author has been going over old and recent ground, and this paper will endeavor to formulate the landmarks of our knowledge in this field.

Milk as it exists in the udder of a healthy cow is devoid of bacteria, as is also that of the human subject; germs of an offending nature reach the milk after it has left the animal. Speaking only of healthy animals and their milk, it is a matter of daily observation that various samples of milk will contain varying quantities of foreign matter, due, no doubt, to varying conditions of cleanliness at the first dairies. Soxhlet and Renk called attention first to the palpable detritus to be found in milk, and this has been often confirmed by my own observations. Aside from straw or dirt from the hands, if milk is allowed to stand in large quantities, small black specks may be seen at the bottom of the containing vessel, if this be glass. These small specks are manure from the udder or teats of the animal; thus it is easy to see how even healthy milk may contain very obnoxious elements. Renk found that different dairies varied in this respect as to the quantity of sediment. Here, in New York, I am happy to say that with care, we can obtain a milk moderately free, though not entirely so, from these elements; but in large quantities (a year ago) I have during the summer season seen these black specks in milk. Thus the bacteriology of milk must vary vastly with the varying amount of care or cleanliness with which the milk is col-

lected,—and results of different authors will also vary, according to the source from which the milk is obtained. But the main principles are fixed, and can guide us in our practice.

If milk be allowed to stand at the ordinary temperature of the room either in summer or winter, it becomes "sour"—acid in reaction; there is a disturbance noticed in the consistency and appearance due to a precipitation or coagulation of the caseine elements of the milk and their separation from the fluid portion of the liquid. This is the acid fermentation of milk found under the normal conditions, and in ordinary milk, and was systematically studied by Pasteur, who described the "ferment lactique" or lactic acid bacillus as the cause and prime factor in this change. The rapidity of fermentation must vary with the temperature and varying conditions of bacteric invasion of the fluid. During the heated term, these conditions are presented at their best, and it is then that the above changes set in most rapidly.

In order to understand the true value of our present methods in dealing with artificially fed children, it is necessary to go over some historical ground, and I promise only to take you where my own studies and observations have led me.

The most admirable work of Hueppe upon milk, its decomposition by microorganisms, is known to you all. I will collect some data from this article first in my resumé.

As an example of the older doctrines upon the decomposition of milk, we may mention the views of Stahl, who writing in 1697, considered fermentation and putrid decomposition as analogous processes, fermentation being only a variety of decomposition. He assumed that in fermentation there was the formation of new combinations and the cause of the decomposition resulted from the transmission of molecular movement to easily decomposable combinations. The great advance in our knowledge of lactic acid fermentation, presupposes that once for all, lactic acid is a very characteristic combination, and on this ground, its separation from other decompositions. Scheele, in 1780, first discovered lactic acid in milk with its great resemblance to acetic acid. It will not aid us to go into a long resumé, so that our purpose will be subserved, if we next look at the work of Pasteur, who, in 1857, described a ferment which was always present when lactic acid resulted from sugar in organic fluids. He described this ferment minutely as small spheroidal bodies forming short links. With this theory of Pasteur, the lance was again taken up for the bacteric as against the chemical theory of fermentation. Later, 1858, Pasteur proved that in various fermentations if lactic acid be present and formed the lactic acid ferment was always present, although there were

numerous other and with difficulty isolated ferments. By excluding the air, his fluids remained unchanged, so that he concluded that the organisms were derived from the atmosphere and did not result from spontaneous generation. He found, what is important in relation to sterilized milk, that in spite of subjecting milk to a temperature of 100° , coagulation resulted, not with acid but alkaline reaction. There was no lactic acid ferment but "infusoria" (potato or butyric acid bacilli). At a temperature of 110 to 112° and $1\frac{1}{2}$ atmospheres, there was a destruction of all life, no infusoria found, and no fermentation resulted. Failure to sterilize the milk was due not to spontaneous generation, but to the presence of a very resistant organism.

Schroeder and Pasteur came simultaneously to the conclusion that milk is difficult to sterilize, because it contains organisms which are very tenacious of life. But while Schroeder assumed that these organisms were present in the milk itself, Pasteur thought they were derived from the surrounding atmosphere. Pasteur first (1861) divided the butyric acid ferment from that of lactic acid, and minutely described the butyric ferment, which he called "Vibrio," and classified it among the infusoria (bacilli). The lactic acid ferment was also minutely described. Lister in 1878, established that the particular organism which he named bacterium lactis caused the acid fermentation of milk, and he by a method of dilution by which each drop of his fluid held a ferment germ, caused sterilized milk to undergo lactous fermentation with acid reaction; he described this organism also very minutely. He proved that other fluids, as water added to sterilized milk, caused other fermentations as butyric, but not lactic acid fermentation. Up to this time, the doctrine promulgated by Schroeder, Schmidt, Hoppe-Seyler, that though an organized ferment may cause lactous fermentation, yet under all circumstances, this was not necessarily the case, but that there were lactous fermentations dependent upon a chemical ferment preëxisting in the milk and derived from the mammary gland.

W. Roberts, in 1874, succeeding in retaining milk drawn from the breast into glasses free from fermentation, and Lister and Cheyne had similar results. Meissner first established in a scientific way, that milk as other fluids, could under certain precautions be drawn from the animal and retained free from decomposition, that is, that decomposition was due to organisms which reached the fluid from surroundings and air. Therefore, the milk in the presence of antiseptic means and high temperature acts not like an enzymatic solution, but as a medium which contains organisms capable of certain resistant powers. Therefore, the cause of lactic acid fermentation is an external one always, and the germs gain access in the stalls and storage

places of the milk. These are only avoided with such caution as to give rise to the idea, as formerly in vogue, the milk itself contained the primary cause of fermentation in the form of a chemical substance.

I have in the above given a short resumé of the principal steps which led to the closer bacteriological study of milk; yet it is surprising that though Pasteur so long ago established the fact that the acid fermentation of milk could be avoided and gave data, no systematic attempt at milk sterilization was thought of in connection with infant therapy, until the work of Soxhlet, preceded by that of Hueppe, appeared, and this is explained by the enormous impetus given to modern bacteriological researches by the doctrines and methods of Robert Koch, which has permeated every branch of our professional work.

When we subject milk to heat, we have to meet the insurmountable obstacle of an organic fluid which not only may contain bacteria which are resistant to a considerably higher temperature than that of ordinary steam, but by the nature of its composition, milk is apt to protect to a very effective degree contained bacteria from the action of the externally acting heat. Again, milk, if heated to too high a temperature, changes in color, and there is a separation of certain elements (butter), and a change in others (caseine and sugar elements). From the temperature of 75° Celsius, there is separation of the serum albumen of the milk. The caseine loses its coagulability to rennet, and at 85° , amounts which for the raw condition are found sufficient to act, cease to be of any effect. J. Munk found that in milk sterilized under three atmospheres, four times the ordinary quantity of rennet was necessary in order to act satisfactorily. Hueppe has confirmed this, as also in another manner Dr. Chapin, who has, it seems, come to the independent conclusion that the caseine of the milk suffers a change in sterilization (*Med. Record*, 1890).

Hoppe found that milk sugar at 80° to 90° suffers a change, which increases at 100° to such an extent that, after two hours' exposure to this temperature, milk and milk sugar solutions become of a brownish tint. At a temperature of 110° this is more marked. Pasteur found that at a temperature of 110° to 112° , and $1\frac{1}{2}$ atmospheres, there is a slight oxidation of the fats in the milk, which gives it a tallowy odor.

Hueppe concludes that between 75° and 100° , the milk is gradually changed in its chemical composition, but these changes are of such a nature that the digestibility of the milk is scarcely diminished, and its taste and odor but little changed. A temperature of 140° may coagulate the caseine (Hoppe), and at 120° coagulation begins to set in, if this temperature is kept up for any length of time.

I have here tubes in which the milk has been subjected to only the Pasteur temperature, $1\frac{1}{2}$ atmospheres and 112° , with only the brown discoloration to be noticed, from inspection.

The above facts are and will be useful in guiding future work upon this subject, and the law laid down by Hueppe still remains true, that from a physiological standpoint, milk is best sterilized (if possible) under a temperature of 75° C., but it may be admissible as far as 100° C.

We have of late years been recipients of many suggestions as to sterilization, but if we look at the mass of matter and suggestions, we will find that though the above principles still hold good, and have been established for decades, the only direction toward which the ingenuity of physiologists and clinicians has exerted itself, has been mostly in the empirical direction of some form of "apparatus." Thus, in the great struggle to invent some unique form of cooking utensil, some great truths have been lost sight of and buried in the débris of apparatus. The sterilization of milk may be performed, according to Pasteur, absolutely, at a temperature of 110° to 112° and an increase of $\frac{1}{2}$ an atmosphere. This has its objections, and these are, as it seems, very formidable, not only from an æsthetic standpoint, but the physiological also. The caseine, which even at 75° begins to change, certainly approaches the coagulation point (from heat alone) at the Pasteur temperature. Not only this, but there is reason to believe that such caseine is even less acted upon by the weak stomach juices of the infant, than we at present are led to believe from physiological experiment. Another method of sterilizing the milk is also a gift of the genius of Pasteur, and that is the so-called "Pasteurization" of milk. In the *Zeitschaf f. Hygiene*, Vol. viii, Heft. 2, Bitter has attempted this method. Milk is heated in large masses up to 70° to 75° , and maintained at this temperature for half an hour, then rapidly cooled; this is done by passing the milk over coolers until the temperature of 18° to 19° is attained. The milk will keep quite well for some time—twenty-four to forty-eight hours; but this scheme is scarcely practicable. What I mean by this is, that no means are as yet at our disposal to place this in every household. Strub (*Bact. Centralbl.*, 1890) gives details of a method by which milk heated to 70° , and very rapidly cooled to 40° or even 20° Celsius for about five successive times, has given satisfactory results in mercantile departments of milk industry; but the apparatus necessary for this, it is needless to say, must be very elaborate.

We next take up the sterilization of milk at the heat of boiling water, in a water bath, that of Soxhlet, of Munich. To this man will always remain the great merit, not of having done anything new, but of practically placing milk preservation within the reach of every housewife,

and of putting into practice certain principles for whose reception the therapeutic world was not hitherto prepared, though these principles were well-known. Soxhlet (*Munich Med. Wochen.*, 1886, p. 253), brought forward in a striking way the advantages of protecting the infant from the acid fermentation of milk, and he eliminated it very easily by, as you all know, placing the nursing-bottles in boiling water and leaving them thus for forty minutes. He also called attention to external sources of uncleanness at dairies, such as pots, hands, and the state of the udder of the animals. Soxhlet, at that time, said that milk thus treated could be kept at the room temperature three or four weeks without spoiling or becoming acid. This I will show is true to a certain extent. It is a misleading statement. He gives some interesting data as to the time and temperatures at which ordinary acid coagulation of milk takes place. Thus: at 35° C. in 19 hours; 25° C., 29 hours; 10° C., 208 hours; 0° , 3 weeks. In any acid milk, fermentation at 35° C. results in the production of 3 per cent. of alcohol, almost as much as that contained in beer. Soxhlet placed great stress upon his peculiar stopper, which I will take up later. It remains that the Soxhlet plan is that of the boiling water bath, and it has its drawback in a certain amount of irregularity of heat conductivity, by which the methods and results are less uniform than that of the next method, which I think is the most satisfactory, and that is the sterilization of milk by the plan first advocated by Hueppe in 1884 (*mittheilungen aus der Kaiserlich gesundheits amt*). By this method, the milk is sterilized in small quantities, but the water does not reach the containing flasks, and steam alone is the means of sterilization. The results are certainly more uniform by the sterilization in steam. By this uniformity, I simply desire to mean that we are first certain that every flask, being surrounded by steam, receives the benefit of the same quantum of heat, 212° , and the latent heat of steam. The conclusions of Hueppe were that steam is most satisfactorily and rapidly generated in the ordinary protected tin pot of Koch, and milk which in reagent glasses had to be subjected to the boiling bath for one hour, was easily protected and sterilized from acid fermentation in twenty minutes in the live steam. This is of great economic, as well as of scientific importance, and is another guiding-post for future work. Occasionally, in this short space of time, the milk sterilized in reagent glasses would subsequently coagulate, but in forty-five minutes the sterilization resulted. Hueppe noticed that in milk which was certainly sterilized at 100° , there appeared gradually a sediment, which he thought contained the separated albumen and coagulated caseine, and the milk above this sediment was more watery than the milk sterilized below 75° .

Thus the milk sterilized under 75° differs from that sterilized at 100° in the more marked appearance of sediment, and its insolubility. Naegeli noticed changes even in milk heated to 110° to 120° after four to six months, both in appearance and taste. Meisl (Hueppe) records appearance of pepton, tyrosin and leucin, and ammonia, in milk apparently sterilized. As far as our knowledge goes, milk may be absolutely protected from future *acid fermentation* by subjecting it to a temperature of 100° in live steam.

I will ask you to notice that there is another fermentation of milk, the alkaline concerning which a great deal of misunderstanding exists, but about which there are certain well known facts to which I beg your present attention.

The acid fermentation of milk is brought about chiefly by a species of microorganisms called by the author, Hueppe, who very closely studied its growth and behavior, the bacillus of lactic acid fermentation of milk. The milk as it reaches the purchaser is very rich in microorganisms, but this one alone is chiefly responsible for the sour reaction of spoiled milk. I show you a culture of this in various media and fluids, and you will see it was well described by Hueppe.

I do not think this is the place for close bacterial descriptions, but let me call your attention to some very interesting data. This microorganism is of small oval form occurring single and in pairs. It does not fluidify gelatin and grows upon all media, when it is inoculated into absolutely sterile milk (milk subjected to temperature of 112° and $1\frac{1}{2}$ atmospheres); there is in a short space of time a coagulation of the caseine elements, but what is most interesting, is the accumulation of bubbles of CO_2 gas at the top of the milk and near the top. I show you a potato culture of the bacillus of lactic acid and you can see the bubbles of CO_2 in this culture also. The coagulum of the milk is peculiar, in that it is traversed by fine spaces and cracks, in which are entrapped bubbles of CO_2 . The spaces become larger and wider; the coagulum contracts after a few days. In these spaces there is a serous fluid. The microorganism measures $1-1.7\ \mu$ long and $.3\ \mu$ to $.4\ \mu$ thick: the bacteria may reach $2\ \mu$ in length. Hueppe thinks they contain spores, especially in sugar solutions; he also found these spores in sour milk. (But this is difficult to reconcile with some statements of Loeffler, which will be referred to below.) This organism grows from 10°C. up and has its maximum growth between 35° and 42° ; it also stops growing and the acidity no longer forms at 45.3 to 45.5° .

It is not necessary to go into further details, but we must remember that the heat of steam, while it may in twenty minutes destroy the lactic acid bacillus, does not entirely destroy the spores, so that a prolonged steaming is necessary to ab-

solutely render these spores innocuous (forty-five minutes). Thus, as mentioned, Hueppe found that test tubes of milk sterilized for twenty minutes in steam, did not always remain free from acid fermentation, the spores subsequently growing and causing acid fermentation, and I myself have seen tubes heated with steam for twenty minutes undergo subsequent acid fermentation in the thermostat, turning the litmus, which was mingled in some of the tubes, red, and finally decolorizing it. The lactic acid bacillus of milk is able for a time to resist the temperature of steam.

It has been noticed (Pasteur, Naegeli, Hueppe, Meyer, Loeffler) that milk which has apparently been thoroughly sterilized, will after a space of time, varying in each case with circumstances of temperature and previous state of the milk, undergo changes and a distinct precipitation, or rather coagulation, sometimes with the formation of peptone, leucin and tyrosin. Pasteur, as above mentioned, established that these changes always occurred in the presence of an alkaline reaction; when milk was sterilized at 100°C. acid reaction was never present. He named the bacteria thus found in the milk so decomposed, infusoria; we know now that they are always rod-shaped or bacilli. Acid reaction is never present except to a slight degree at first with the butyric acid bacillus (Hueppe), but alkaline reaction soon results even here. Hueppe first described a butyric acid bacillus (aerobic) which he found in milk which had been subjected to three atmospheres of pressure with corresponding high temperature. This milk was decomposed and contained a bacillus which was very resistant and could withstand very high temperatures; even much higher, as you see, than the $1\frac{1}{2}$ atmospheres of Pasteur. This bacillus or microbe contains spores and it is in this the resistance to temperature exists. Hueppe described this bacillus minutely, and we are able to find it to-day in milk (Loeffler). I have been able to isolate a bacillus very much resembling it with others from milk sterilized by various apparatus and have found it in a sample of milk which had been sterilized by the Escherich new large sterilizer, in which the milk is sterilized in quantities of about a quart. The milk was taken from the sterilizer on the second day after sterilization. The milk was slightly alkaline and subsequently became very alkaline in reaction with small and large soft clots of a peculiar odor. This is nothing new, but it will explain other facts hereafter to be stated. The ordinary potato bacillus (bacillus mesentericus vulgatus of Flügge) was also present at the same time. Loeffler (*Berlin. Klin. Wochen.*, 1887) not only confirmed Hueppe's investigations, but found other bacteria, all varieties of the ordinary potato bacillus, in milk which had been subjected to the temperature of steam for ten min-

utes. This temperature destroys the bacilli and other bacteria, but not the spores, except those, this not always as Hueppe found, of lactic acid fermentation. These spores subsequently decompose the milk through their proliferation, but always with alkaline reaction. The coagulation of the caseine is also of a more flocculent character. There are first the ordinary potato bacillus, the bacillus *mensentericus vulgatus* of Flügge, then the white bacillus, a subvariety, as also the gummy (bacillus *liodermos* of Flügge), and a third variety of the same organism which Loeffler calls the white bacillus. It would be sufficient to mention these here and to show how they grow only in sterilized milk. In sterilized milk, the potato bacillus (first described by Hueppe) after a few days in the thermostat causes the appearance of a clear zone underneath the cream zone at the top of the milk. This zone varies from a clear to a cloudy one, according to the varieties of potato bacillus which is inoculated or growing in the milk. Crystals of leucin and tyrosin appear at the bottom, in case of the white bacillus. The reaction of the milk is distinctly alkaline. The most important lesson to be learned from the above is that milk well sterilized by steam with any apparatus (Koch, Soxhlet, Escherich, Arnold steam cooker) will after a time decompose with an alkaline and no acid reaction. The time at which macroscopic changes appear has been regarded by some authors as the surest sign of decomposition, but they have mostly, even in late times talked of the milk becoming sour, as you see it does not undergo acid fermentation but alkaline fermentation.

Strub (*Centralbl. f. Bact.* 1890) has experimented with almost every known apparatus and was able to establish even immediately after sterilization the potato bacillus in the samples of milk which she used. She also established that repeated fractional sterilization in a Koch apparatus was not sufficient, even after many repeated steamings, to entirely destroy this bacillus (its spores).

Especial interest is the behavior of bacteria when inoculated into milk (sterilized) to which litmus (1-10) according to Liber and Marpman, has been added. There is a gradual decolorization of the litmus in some, showing that there is something formed aside from pure alkalinity or acidity, which has oxydation action upon the litmus.

I show also that the lactic acid bacillus turns the milk with litmus red and finally decolorizes it. The streptococcus *pyogenes* turns the milk acid, litmus red and finally decolorizes it. The typhus bacillus (Loeffler) turns litmus (sterilized) milk slightly red. Tubercle diphtheria and cholera microbes grow very well in milk without causing any marked change in the same. The substance which with the lactic acid bacte-

ria and potato bacillus causes decolorization, is not as yet established.

The object of this paper being a review of our knowledge of sterilized milk and its value, as also the writer's observations in this line, it is foreign to consider here the decompositions or contaminations of milk as we find it in the stores. The heat of steaming is a protection against those microorganisms which cannot withstand this high temperature and maintain life (tuberculosis, diphtheria), as also against the occasional animal diseases. The blue milk and stringy slimy milk (Hueppe) as also even tuberculous milk, form such a distinct field of work, that a separate paper could be written upon them alone. What practical deductions can be drawn from what has been stated above concerning ordinarily good milk and its sterilization, seems very evident. The first is that milk can be thoroughly protected from subsequent rapid acid decomposition by exposure for a certain time to the temperature of steam, and to accomplish this, the several apparatuses in the market are entirely efficient. It matters very little how many or what variety of microorganisms exist prior to steam, after this only those microorganisms remain capable of proliferation whose spores have a resistance against continued application of 100° C. These in normal milk have been shown to be the butyric acid bacillus and the various varieties of the ordinary potato bacilli. If milk be sterilized and it is found to contain these microorganisms after steaming, their number and capability of doing injury to the milk will vary very much with the conditions under which the milk has been collected. If these microorganisms preëxisted in enormous quantities, the alkaline fermentation will under a favorable temperature, set in sooner. If in small quantities, the macroscopic changes of the milk will be scarcely perceptible for some time. If milk could be carefully collected and sterilized at the dairies it might be kept indefinitely after sterilization. Thus, it is seen that even directly after steaming the microorganisms and their spores exist in sterilized milk if they cause the subsequent decomposition. Strub (*Centralbl. f. Bact.* 1890) found that the variety of cork or method of closure of the bottles in childrens' apparatus had very little to do with this subsequent decomposition. Bacteria were present in the sterilized milk, no matter what kind of closure (Soxhlet, cotton, ordinary rubber) was used. But the most important point here to remember and what is known to those who have given thought to this subject, is that the bacteria of the alkaline milk fermentation are very slow to proliferate in sterilized milk; at room temperature the changes in the milk are at best delayed for a few days, even a week, and when the changes are not so marked as to be detected by the eye; such milk has been sold in

the stores and given by others to infants without *seeming* deleterious results, at least not such as are immediately apparent after administration of sour milk. Therefore the influence of bacteria which remain in normal cows' milk after sterilization is of little practical bearing for infants, inasmuch as most families prepare milk daily, and I have never nor can I find data where any one else has found the alkaline fermentation in milk so marked, after, say, forty-eight hours, as to cause macroscopic marked changes. I refer only to the infant apparatus and summer temperatures, and not to those experiments in the laboratory where sterilized milk is inoculated with masses of active potato bacilli spores and bacilli themselves, and specimens of which I show you here. I would not approve, therefore, of the use of any milk in the city which, however well sterilized, was kept for days, and though its color was good, as also its appearance, and it tasted well, is the seat of advanced changes. We find such milk sold in stores where the bottles have been kept even two weeks after sterilization. True, the alkaline fermentation has not been investigated to such an extent that we can with certainty pass upon the deleterious or non-deleterious effect upon infants of the products of this decomposition. It is enough that they take place, and certain alkaloid elements are surely produced, but very slowly, and if the milk is steamed as in the household daily, may be disregarded; but the storage of sterilized milk and its subsequent use after prolonged periods, is to be strongly discountenanced. Therefore in the future, we will know how to interpret those authors who condemn sterilized milk with faint praise by stating the number of bacteria (?) they have found in sterilized milk without stating the whole case. I have had this "clear statement of the case" in view when I undertook the above work, and I hope I have, in a degree, succeeded.

To state that bacteria exist means very little, we must know what variety and their behavior. There is an important practical point which to the writer seems pertinent here: Many physicians have often told me, and no doubt you also, that they find the boiling of the milk sufficient sterilization, or that they cannot see why it is not fully as good as continued steaming. Never was a greater fallacy born of empiricism. Hueppe has shown that milk in small test tubes (10 ccm.) exposed for twenty minutes to the action of live steam at 100° C., are not surely protected from subsequent acid fermentation, and that some of his tubes thus treated turned sour after a time. Here is a tube of milk stained with litmus originally and exposed for twenty minutes to the action of steam in the Koch pot. After placing it in the thermostat at a temperature 35½°-36° C. it turned red in twenty-four hours; this became more marked until full coagulation of caseine re-

sulted, and with decolorization of the litmus. Thus, simple, single boiling of the milk, as it is performed in the kitchen ordinarily, is insufficient to protect milk, aside from facts of exposure of milk to atmosphere and handling subsequently, which enhances chances for decomposition.

Physiological.—There have lately been some experiments, and notably by E. M. Hiesland and H. D. Chapin, upon the digestibility of sterilized milk and the chemical changes in milk brought about by steaming. Their conclusions are so much in accord with those of Hueppe and Munk, their quotation here would only repeat what has been recorded above. Dr. Hirst (*Med. Rec.*, 1891, February), has gone so far as to suggest the addition of milk or some pancreatin powder, before sterilization, in order to digest and help the digestion of the caseine made difficult of digestive solution during steaming. Whether this will prove a valuable suggestion remains to be seen. For myself, I must say I still hesitate to put any digestive powder in the milk of the healthy infant, but in a stomach which proves rebellious, I have been in the habit, like many others, of adding powders to sterilized milk, but have hitherto done this after sterilization and just before giving the milk to the infant. The physiological data of our knowledge in this department of infant dieting are still very meagre, nor has the stomach washing of infants before and after ingestion of foods thus far aided us materially in coming to definite conclusions. Interest has lately been aroused in the discussion of the amounts of milk to be administered to the infant at each feeding. On the one hand, we have Dr. Escherich, who is still guided mostly by the age of the infant, and on the other in our own country, Seibert has advocated the weight as the only criterion for infant feeding; Seibert would reject all past methods and ask his adherents to give certain amounts to certain weights of children. Seibert gives us a table. But these agitations have had their uses, and now attention is being directed more fully to this subject than hitherto.

I have always been guided as follows: I weigh my children always at the beginning of treatment; if their weight comes up to the standard or nearly so, they are given the amount of food which long series of experiments by physiologists and clinicians have proved to us to be adequate for normal children at certain ages. (Vide Fleischman *Pædiatrische studien*, Vienna, 1875). If the infant is markedly atrophic, and as I have seen at three months only weighing less or much less than an average infant at birth, a proportionate amount of food is given. The weight of the child divided by the weight that would be normal, multiplied by the amount of food (grams) necessary to an infant of normal weight and development, at each feeding.

X—weight of infant; Y—weight of normal infant of same age; Z—amount of food at each feeding which is normal to an infant at that age (as far as our knowledge goes).

$\frac{X}{Y} \times Z$ — amount of food to be given at each feeding.

The above digression is warranted by the close connection it bears to any theme of infant feeding, and especially in sterilization, where the size of the individual bottles are a matter of care to the mother.

I cannot close this paper without some practical suggestions, and if they appear trite, they have at least the value of being based upon a large experience. As intimated it would be ideal to sterilize milk in small or large quantities at the dairies, but this has never yet been attempted in this city.

The writer uses as a sterilizer the ordinary wire basket with eight bottles, sold everywhere with the ordinary rubber cork. If the patient can afford it and wishes a rapid steam generator, the patent cookers are good, if not, any pot will do which is big enough to hold the wire basket of bottles. The milk or milk and deluent are placed in the bottles, which have been thoroughly cleaned with hot soda water, and an inch and one-half of water is placed in the bottom of the pot; when the water is boiling, the basket of bottles (without corks) is lowered into the pot and the same is covered. They are steamed thus for ten minutes to drive residual air out of the bottles. The pot is opened and each bottle is firmly corked and the pot covered, and steaming continued 45 minutes longer, when it may be considered completed in any weather. The basket of bottles are then placed in a shady cool place. If the family be intelligent and the bottles are not to be transported, the baked or even ordinary cotton may do as closure for the bottles.¹ Future efforts must also be made in order to obtain for the infant a milk which will be as free from contaminating elements as possible. A strict hygienic surveillance of dairies by competent persons, who can recognize diseased animals and milk, a strict accountability as to cleanliness of animals, utensils and hands. The rejection of receptacles which are unclean or composed of objectionable material will render milk sterilization in the household still more effective than it is at present.

¹ The fault to be found with the sterilizers now upon the market (Arnold and other patent cookers excepted) is that though they can all be used a la Soxhlet, there is not space enough between the bottom of the basket and that of the pot to allow of the use of the apparatus with steam alone, that is the introduction of 1½ inches of water and its steaming for one hour without the contact of the milk bottles and the water; this causing breakage. A firm in Baltimore is constructing a very cheap but complete sterilizer from my plan which will obviate these objections and be within the reach of the most model household, per basket, bottles and corks complete.

INFANT DRESS.

Read in the Section of Diseases of Children, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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The average practitioner of medicine pays too little attention to the subject of infant dress. He goes about his daily duties, cares for and applies remedies to the sick infant, and, it may be, never gives a thought whether the child is properly clad, or if the material from which the clothes are made furnishes sufficient protection from the sudden atmospheric changes to which its delicate tissues are exposed. When he attends a confinement case, he seldom hints at any proper, hygienic method of arranging the baby's apparel, or dictates to the unscientific nurse what the infant shall wear. This leaves the subject to the mother, who, in the majority of cases, ignorantly binds the infant hand and foot, so that there is interference with the proper development of its muscles. Then, as the child struggles and cries for freedom, it is doomed to the conventional dose of peppermint or paregoric.

Scarcely can any one find in our text-books more than a passing remark on the hygiene of infant dress; in fact, it seems to be thought quite out of the province of medicine, and nurses become indignant when a physician attempts to suggest that he knows more about the needs of a child than they. Few good physicians doubt that the average infant is unwisely clad at the present day. It is bound too tightly, clothed too heavily, especially about the waist, and the style of garments renders the free use of its limbs practically impossible.

Let us see how the average newborn child of to-day is dressed. The baby being washed, the navel string is wrapped in a bit of linen, often well greased, and a flannel binder, extending from nipples to hips, is tightly wound around the body two or three times, and secured with four safety pins; the objects being to keep the abdomen warm, and prevent hernia when the child cries or strains.

Let us pause here a moment, and consider this binder. The Creator made the abdominal walls of a child elastic for a purpose, namely, to expand and protect vital organs when the little one cries, coughs or strains. If let alone, does it usually rupture? No. In crying or straining, the walls distend evenly in all directions, thus protecting the feebler portions, where hernia is apt to occur.

The binder prevents this even distribution of force, hence, the whole energy of the straining comes on certain parts of the walls that are weaker, and which, unfortunately, the binder

does not protect, and hernia is the result. It is the bandaged baby that becomes ruptured.

Now, suppose the binder is used for warmth alone, and is applied loosely, what happens? We undress our infant to find the binder up under the arm-pits, and the abdomen exposed. I have yet to see the necessity for any binder at all, unless to retain the dressing about the navel, and that only for a few days.

The best dressing for the navel, I think, is a simple pad of dry, antiseptic, absorbent cotton, wrapped about the cord, and left secured with a turn of a roller bandage, or a piece of adhesive plaster.

The next article of apparel is the shirt, made of all sorts of material; all wool, cotton and wool, silk, silk and wool, flannel; and I have even seen one made of linen, the coldest of goods, and starched stiff at that, keeping the baby fretting.

Then comes the pinning blanket, a long wool garment with a stout band, often of cotton. This is pinned snugly around the body up under the arm-pits, so snugly, in fact, that it materially interferes with the free expansion of the chest walls. One side is folded over one limb, and one over the other, and the bottom turned up and pinned, thus the infant is unable to move a limb. When a change of diapers is desired, the blanket is unfolded, exposing the child from foot to abdomen.

Now, a baby so exposed to varying degrees of temperature, and especially if overheated or perspiring, offers a factor in the etiology of any acute disease.

Next comes the skirt, with the same objections as the pinning blanket, tightness and inelasticity about the chest walls. This serves to increase the bulk and weight of clothing around the body of the infant, leaving the shoulders comparatively unprotected by only the light shirt and thin muslin slip, the last garment to be added.

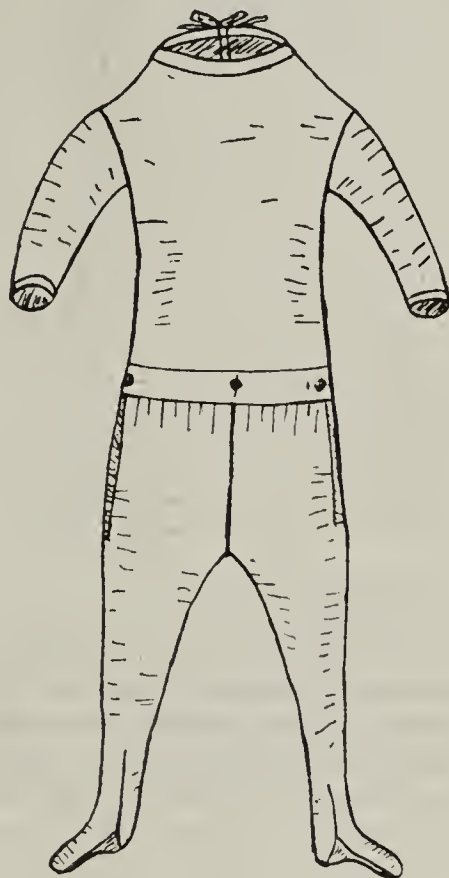
Such is the dress of the average infant of today, and I ask, is it not time for us, as physicians, to give more thought to this subject, and still, if possible, more hygienic and practical methods of dressing young children, to the minds of our respective communities?

The problem before us to solve, is to find something that will allow freedom of muscular movements, and having simplicity, will furnish warmth and protection.

First, let us consider the material to be worn next the skin for young infants. Of course this largely depends upon the financial condition of the parties interested, but the texture should be soft, non-irritating in character, warm, and as light in weight as latitude and climatic conditions will allow. Quality should take the place of quantity in baby clothes.

Then, too, we have the various infantile consti-

tutions to adapt our suitings to, because sickly infants, or those susceptible to colds from atmospheric changes, need greater protection than the robust and healthy. For those that can afford a dollar a yard, or more, the silk and wool flannel furnishes as complete protection as any material, and is, perhaps, the best goods to be worn next the skin; care, however, should be taken in washing it, as well as all other woolen goods. All wool materials are rather harsh and irritating to an infant. For the middle and lower classes there is nothing better than canton flannel; it is soft, warm, shrinks little, and can be obtained in various grades of quality, from 12½ cents to 50 cents a yard. For sickly children, an eider-down flannel is an excellent protective.

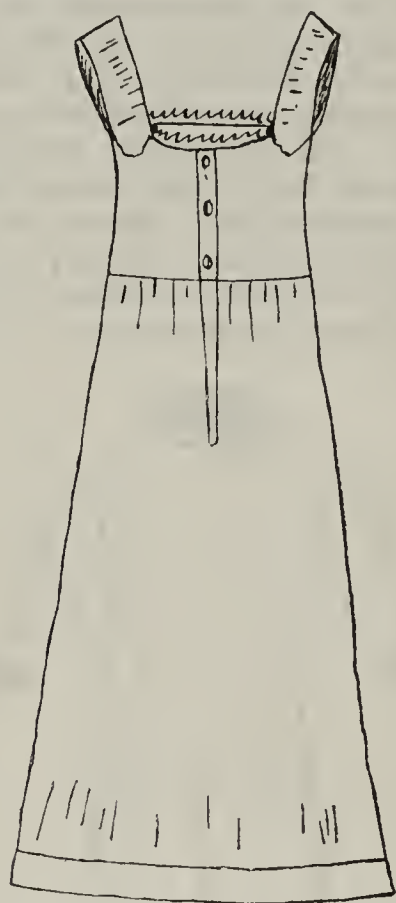


*Whole of undergarment
front view*

The infant dress I have to propose consists of an under-garment, covering the body from neck to feet; a skirt, supported from the shoulders; and a flannel slip in the colder months, or a muslin in the warmer, for an outside dress. There is no necessity for binder, socks or pinning blanket. I have for some time entertained the thought of reducing the size of the ordinary shirt and drawers pattern of nightgowns, worn by older children, to fit the average infant of two months, thereby allowing for the largest newborn child, or for the growth of the average baby to two months.

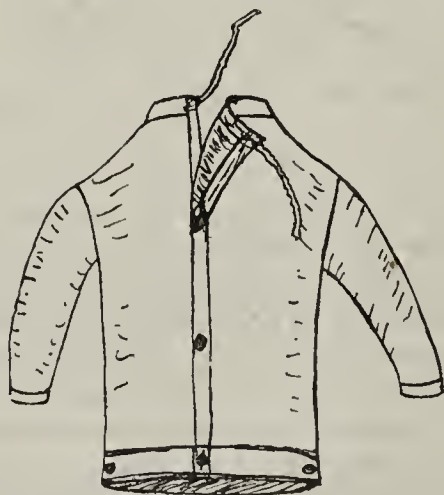
The development of this thought is the undergarment here exhibited. One modification I found by experience was necessary, namely: the

drawers should be made to separate from the shirt, if I wanted to make the changing of diapers easy, and avoid the washing of a whole garment where one part only was soiled. The under-garment can be made by any seamstress,



Flannel skirt

to cost as little, or much, as the quality of goods used requires, and as prettily as the style of garment or fancy of the mother permits. It consists of a shirt made with sleeves, opening in the back and reaching from neck to hips, long enough



Back of shirt

to meet the growth of the baby by simply altering the four buttons at the waist, to which the drawers are attached. This allows the whole garment to be supported from the shoulders.

Two buttons at the back opening of the shirt

are sufficient, a tie-string in the neck taking the place of the third. Lace may be put about the neck and sleeves. The drawers are made with flaps, as in the ordinary children's style, loose enough in the seat to allow for diapers. It is easier to unbutton four buttons, turn down the flaps and change diapers, than to unfold and unpin a pinning blanket, and in this suit all undue exposure of the limbs is prevented. The legs of the drawers are made to cover the feet, so that socks are unnecessary. It is intended to cover the under-garment with a simple skirt of good flannel, supported by shoulder bands, and reaching 5 inches below the feet, and over this a light flannel wrapper or muslin slip.

Thus the infant is clothed as prettily as the mother desires to make the suit, and as loosely, evenly and warmly as the interests of its own health require.

1438 Dorchester Ave.

"TETANUS NEONATORUM."

Read before the Section of Diseases of Children, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY B. A. WADDINGTON, M.D.,
OF SALEM, N. J.

I have seen in a practice of over twenty-six years eight cases of "Trismus Neonatorum;" of these six have been fatal in their termination, two have recovered.

I believe it to be of parasitic origin, the micro-organism most likely a "coccus." I do not say that it never occurs in the lying-in room of the cleanly with proper aseptic surroundings, but know that in all the cases I have seen the environment has been one of filth and squalor. My experience shows that more cases occur among the negroes than among the whites. Of the eight cases seen seven were negro children and one white child.

In the six fatal cases I resorted to the usual remedies: Calabar and chloral hydrate internally, chloroform by inhalation, ice to spine, Marion Sims' procedure of manipulation of occipital and parietal bones to relieve pressure upon medulla oblongata or cerebellum, but all of no avail, the little ones died. But I now believe with proper aseptic and antiseptic treatment, there should seldom, if ever, be seen a case of "Tetanus Neonatorum."

In support of this theory, will report my two cases of recovery, with treatment:

Case 1.—Was called to see child (colored), at 12 M., January 10th, 1889, six days after its birth. Upon opening the door of the room in which the child was lying, a tetanic spasm was induced, lasting about three minutes, trismus marked, deglutition impossible, oposthotonos well defined, temperature 110.05 F. Upon examination of ab-

domen found that the cord had sloughed off, leaving a nasty cauliflower excrescence exuding an ichorous discharge. Had the parts thoroughly cleansed with beta-naphthol solution and applied iodoform dressing, ordered internally one grain beta-naphthol and one grain chloral hydrate every hour, found no overlapping of occipital or parietal bones. Remained in the house about two hours, during which time the child had ten decided convulsions, ordered remedies continued and dressing changed at bedtime. Saw patient at noon the following day, found him sleeping quietly, had had ten or twelve light fits, the mother said, since I had been there, had made several futile efforts to get hold of nipple, had succeeded about an hour before my arrival, nursed freely and went to sleep. Ordered same doses of naphthol and chloral at two hours' interval and reapplied dressing to navel. Saw patient again at 4 P. M. next day, free from convulsions and all bad symptoms.

Case 2.—On March 3d, 1891, was called to see Mrs. —, the wife of a junk dealer, whom I had put to bed in labor ten days previous, and delivered of a healthy male child. She was suffering from a slight hemicrania, for which I prescribed, and was about leaving the room when she called my attention to the baby. She said that through the night he had tried to nurse but seemed unable to take hold of the nipple, but that she believed that he had three or four light fits.

I asked to see his abdomen, and while the mother was unpinning the bandage a marked and decided tetanic convulsion occurred, trismus, sardoniac countenance and the most pronounced opisthotonos I have ever seen in a baby. Found the navel in a filthy condition, protruding granulations and foetid discharge. Ordered at once the thorough cleansing of the parts, syringing with peroxide of hydrogen and dressing with beta-naphthol; while this was being done the child had a number of convulsions, the least noise or draught being sufficient to produce one. Ordered beta-naphthol in one grain doses every half hour, and chloral hydrate, one grain doses every hour. This was at 9 P. M. Saw patient again at 12 M. the day following, symptoms greatly improved, had taken the breast once, the spasms were further apart and less violent, had slept considerably, ordered remedies continued but at further intervals. Saw child again next day at 3 P. M., all trismus gone, able to nurse freely, had had but two light spasms since I saw him last, navel quite healthy in appearance, and all foetor gone, continued the washing with peroxide and the dressing of beta-naphthol and internal remedies every three hours. Saw child next day at 10 A. M., well. Saw him again yesterday, still well.

THE EPIDEMICS OF INFLUENZA OF 1890 AND 1891 IN CHICAGO.

Read at the Congress of American Physicians and Surgeons before the American Climatological Association, Washington, D. C., September, 1891.

BY E. FLETCHER INGALS, M.D.,
OF CHICAGO, ILL.

The epidemics occurring in Chicago the last winter and the preceding year differed from each other considerably in their effects upon the respiratory and digestive organs and the nervous system.

In 1890 the disease made its appearance about the first of January, but in 1891 not until nearly the first of March.

Persons of every class, all ages and either sex were attacked, but, as indicated by the observation of Dr. J. Suydam Knox¹, children suffered from it much less than adults; however, Dr. Charles Warrington Earle² saw many cases in children whom he thought experienced the same symptoms as adults. From my own observation, it appears that children were much less frequently affected than those of more advanced years.

The exact period at which the influenza first showed itself cannot be determined. Four or five weeks preceding the actual beginning of the epidemic, many patients suffered from acute rhinitis and sore throat, which were often termed influenza, though they did not appear different nor much more frequent than the colds which prevail in ordinary years.

However, during this same time, there occasionally occurred cases presenting the peculiar symptoms of sudden fever, malaise, great prostration and aching of the muscles, which have been so noticeable during the two epidemics. These isolated cases presented all the characteristics of influenza, and doubtless were of that nature; and it is probable that the peculiar condition or conditions causing them had more or less to do with some of the cases of acute rhinitis and sore throat just referred to.

The statistics of the Chicago Board of Health show that in 1890 there were 64 deaths in January from influenza, 37 in February, and 7 in March; and that in 1891 there were 4 in January, 6 in February, and 155 in March.

These, however, cannot be taken as accurate indications of the prevalence of the disease, for the returns are made by practitioners of all kinds, many of whom, during the reign of the epidemic, in order to retain the good-will of their patrons, found it expedient to confirm the diagnosis of "La Grippe" which had already been made by the patient or his friends. However, in these same months there were a larger number of deaths from pneumonia, very many of which were due to the influenza as a primary or com-

¹ Chicago Medical Recorder, p. 46.

² Ibid, p. 462.

plicating factor, and the prevalence of inflammation of the lungs, as pointed out by Dr. N. S. Davis, Sr., may fairly be taken as an indication of the extent and virulence of the epidemic.

In 1889, the year preceding the first occurrence of the epidemic, which was an average winter, there were recorded 384 deaths from pneumonia during the first three months; 128 in January; 111 in February, and 145 in March.

In 1890, the first year of the epidemic, during the same period there were 1,096 deaths from pneumonia, and in 1891, the same period, 1,233, of which 280 were in January, 233 in February, and 720 in March. The greater development of nervous diseases, as shown by Dr. Archibald Church,³ is also to some degree an indication of the extent of the epidemic.

As the character of the disease became pronounced, its accession was usually marked by a mild degree of inflammation of the mucous membranes, with lassitude, weariness, pain in the muscles, more or less distinct chill, and fever, ranging from 102 to 105° F. The pain was usually of a neuralgic character, and frequently disappeared within one or two days. In some instances, the mucous membrane of the eye and ear, in others of the respiratory passages or digestive organs, and in still others of the urinary tract, were most affected.

Dr. F. C. Hotz⁴ observed a large increase in the number of cases of conjunctivitis, both in dispensary and private practice, though there was nothing peculiar about the inflammation. More frequently he noticed inflammation of the cornea, ushered in by symptoms of acute irritation similar to those caused by a foreign substance under the conjunctiva.

These were always confined to one side, and were of two types; in one there was a zigzag line of superficial ulceration beginning at some point on the border of the cornea, and traveling toward the center, always confined to the surface layer of the corneal epithelium. In the other the surface of the cornea showed no disturbance, being smooth and brilliant, but on close examination by focal illumination, small, round, grayish spots were found located in the deeper layer of epithelium. In these latter cases, the pain and sensitiveness of the eyes, the quick reaction to the slightest touch, and increased secretion of tears, were very marked. These were easily mistaken for simple conjunctivitis if the cornea was not brilliantly illuminated by focal light. In these the congestion of the conjunctiva was pronounced, but did not show that dense red zone around the cornea usually characteristic of the inflammation of that tissue. The superficial ulceration recovered quickly, but the latter variety was of slow progress, and two months was the shortest period in which the eye recovered its normal con-

dition, though the ultimate prognosis was good in both varieties.

In the treatment of these cases, cocaine was the only local remedy which gave even temporary relief. Mydriatics seemed to act indifferently, or even to aggravate the irritation. Quinine internally had a decidedly beneficial effect on the neuralgic symptoms.

He observed numerous cases of inflammation of the middle ear, some of mild form, causing the patient but little pain or inconvenience, except a feeling of fullness in the ear, tinnitus or a buzzing sound, with slight deafness.

In others the inflammation was more severe, attended by rapid secretion of fluid, deep congestion, and marked bulging of the drum-head, with violent neuralgic pain in the ear, radiating over the side of the head. In these the hearing was speedily lost, and sometimes the drum membrane was perforated within the short space of twelve hours. The pain, which was of a severe form, did not usually, as in ordinary cases, subside with discharge of the secretion from the middle ear, but often continued for some time afterward. These cases were unilateral.

As a rule, the prognosis was good, no matter how severe the symptoms, and in most cases there was speedy recovery, but in a few the mastoid cells became involved.

He relied upon quinine internally to relieve the neuralgic symptoms, and recommended mild local applications, under which he had observed the quickest recovery.

Instillations of warm solutions of boric acid, with cocaine, and the occasional use of the Eustachian catheter for relieving the middle ear and tube of accumulated mucous, constituted the main local treatment.

Dr. Church⁵ believes that there was a well-marked variety of influenza properly designated "nervous," which was indicated by the almost instantaneous prostration after the onset; the disproportionate asthenia during its course; the severe rachialgia, neuralgia, headache and sleeplessness, and the subsequent long, persistent neurasthenic state.

He believes the infection of influenza had a marked action upon the nervous system, giving rise to immediate acute manifestations, or to remote and persistent conditions; and that in those predisposed to la grippe, it was competent to cause marked excitement or great depression of the motor, sensory and mental apparatus.

During the progress of the epidemic, we observed frequent cases of this variety of the infection, indicated by pain, nervous prostration, local sweating, convulsions, coma, delirium and mania. During the prevalence of the epidemic, the deaths from nervous diseases were more than double the

³ Ibid, p. 418.

⁴ Ibid, p. 413.

⁵ Loc. cit.

number returned for the similar periods in other years.

The first epidemic was characterized prominently by rheumatoid and muscular pains, sometimes followed by articular rheumatism, and the last epidemic more by disturbance of the digestive organs.

The epidemic of the past winter has been followed by a widespread outbreak of typhoid fever, which, according to Dr. William E. Quine,⁶ has rarely, if ever, been equaled for the season of the year in this or any other section of the country; while in 1890, consecutively to the epidemic or concurrent with it, cerebro-spinal meningitis was extremely common.

Dr. J. H. Hollister⁷ had observed, as a prominent feature of the last epidemic, a form of continued fever, running from five to fifteen days, with high temperature and without intermissions, usually termed typhoid, but differing from it in that the specific ulcers of the glands and the characteristic stages and symptoms of typhoid fever were absent.

The effects of the disease upon the respiratory mucous membrane occurring under my observation did not differ materially in the two epidemics. There appears to have been some difference in the type of pneumonia, that of 1890 being more commonly of a catarrhal character, or broncho-pneumonia, and that of 1891, more frequently than in the former epidemic, of a croupous character. From my own research, I would conclude that during the past winter the tendency to the development of inflammations of the pleura has been much more pronounced than during the preceding winter. Many cases appeared peculiarly liable to terminate in suppuration. This view differs from the impressions of Quine,⁸ who thought the suppurative process more common in the epidemic of 1890.

The attack of influenza was usually ushered in by a mild degree of inflammation of the conjunctiva, Schneiderian membrane and the fauces, characterized by lachrymation, profuse watery discharge from the nares, swelling of the turbinated bodies, and more or less congestion of the mucous membrane of the nasal cavities, with more marked congestion and soreness of the fauces. However, the inflammation in any of these localities was usually comparatively slight—much less than ordinarily anticipated in influenza; indeed, even less than frequently attends ordinary cold. In such cases, in the course of thirty-six to forty-eight hours, the disease generally progressed to the larynx, where it was characterized by hoarseness and a hacking, annoying cough. After three or four days, all evidence of the attack frequently subsided. This was a most common site of the disease in both epidemics. Next in frequency was one in which

the trachea was chiefly involved; indeed, this seemed to me the most frequent of all where the patient was ill enough to consult a physician. The tracheitis was usually preceded by either rhinitis, pharyngitis, or laryngitis, but not infrequently was developed soon after the first symptoms of the attack, particularly without the intervention of inflammation of the upper air passages. It was usually attended with a most persistent tickling sensation in the trachea, which would provoke frequent, spasmodic coughs, generally attended, after thirty-six to forty-eight hours, with free expectoration. After four or five days, the sputa became of a thick, mucopurulent character, and often quite offensive to the patient. Such attacks, as a rule, were more protracted than those of the upper portions of the air tract, and often extended over three or four weeks.

Not uncommonly, in these cases, two months elapsed before the cough entirely subsided, and even then, on the occurrence of the slightest cold, the patient frequently complained of the same tickling sensation in the throat and irritating cough. Simple bronchitis, characterized by frequent spasmodic cough, and more or less profuse expectoration, was observed in a considerable number of cases, usually associated with one or other of the affections already mentioned, but occasionally independent. This, when uncomplicated, was not, as a rule, so obstinate as the tracheitis; however, in some instances, convalescence was delayed for several weeks, and in not a few cases the inflammation extended to the capillary bronchial tubes, and true catarrhal pneumonia was developed, which proved a most serious complication, and in not a few instances a fatal malady.

The majority of cases of pneumonia growing out of influenza were of the catarrhal variety, but it appeared to me that more were of this type in 1890 than during the past winter, when croupous pneumonia was peculiarly prevalent; the latter has usually run very much the course of ordinary croupous pneumonia, except that the patient has generally been more prostrated, and convalescence has been longer delayed. Pleuropneumonia has also been especially frequent, and uncommonly disastrous.

Cardiac symptoms, as irregularity, intermittence of the pulse, which was usually rapid but occasionally slower than normal, were frequently noted.

Dr. Quine⁹ had occasionally observed individuals who suffered from the grippe in 1890, still presenting a pulse rate varying from 40 to 60 beats per minute, accompanied by an enfeebled general condition, and with a strong tendency to syncope. Some cases of well-marked angina pectoris were developed during the epidemic, appa-

⁶ Loc. Cit. ⁷ Ibid, p 460. ⁸ Ibid, p. 459.

⁹ Loc. cit.

rently as the result of the influenza. Undoubtedly the cardiac complications frequently resulted from a rheumatism which was associated with the influenza, but most cases were apparently of nervous origin, and in some myocarditis or fatty degeneration of the organ appeared due to the specific effects of the morbid agent causing the epidemic, independently of rheumatism or other diseases in which the heart is secondarily involved.

Renal affections were frequently observed by Dr. I. N. Danforth¹⁰ as the result of the influenza, which appeared to induce, first, hyperæmia more constant and intense than provoked by other acute febrile diseases; second, a catarrhal nephritis; and third, a croupous nephritis, as demonstrated by an increased quantity of albumin, and the presence of true hyaline casts.

The essential points in the diagnosis of influenza implicating more particularly the respiratory organs, as we observed it, were the sudden accession of fever, with headache and excessive aching of the back and limbs, peculiar prostration, and the symptoms and signs of inflammation of the mucous membrane. It was distinguished from ordinary acute inflammation of the respiratory mucous membrane by the history and physical examination. Acute follicular tonsillitis often gives almost precisely the same symptoms as influenza, and can only be distinguished from the latter by an examination of the throat.

Laryngitis, tracheitis, or bronchitis due to the epidemic, could only be distinguished by the history, the excessive fever, and by the unusual pain which attended the attack of influenza.

The prognosis of influenza has been considered so favorable that the laity, and even physicians, at first considered it a laughing matter; and it is true that the majority of cases recover after a short time, even without medical care. But many cases terminated fatally, especially when occurring in the aged or infirm, and the large mortality from other inflammatory diseases, especially of the respiratory organs, and of the gastro-intestinal tract, was undoubtedly largely due to the influenza. In a light attack, two or three days were generally sufficient to establish convalescence, and many patients continued their avocations, in spite of the discomfort caused by fever and nervous prostration. Even when the trachea and bronchial tubes were involved, three or four days were usually all the patient allowed before he considered it necessary to be again about his business. The prostration, however, entailed by the attack, usually continued from one to two or three weeks. Either of the forms of pneumonia growing out of the influenza generally lasted from 50 to 100 per cent. longer than attacks of the disease without the epidemic influence, and the fatal cases were much more common.

Patients who suffered from pneumonia, and even those who had comparatively mild attacks of tracheitis, or bronchitis, were often left in a depressed condition, which rendered them peculiarly prone to ultimate development of tuberculosis, and preëxisting phthisis was usually greatly aggravated, and its progress accelerated by the influenza.

I think I am perfectly safe in saying that during the past year, hardly a week has elapsed that I have not seen some case of phthisis directly attributable to this disease, and serious affections of the heart have not been infrequent.

Our treatment of these cases has not been essentially different from that of inflammatory affections of the same part occurring independently of the epidemic influence. However, careful attention to the nutrition, ferruginous and bitter tonics, especially strychnia, have been demanded more imperatively than in simple inflammations, and ultimately a change of climate has been more often required.

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CURABILITY OF CONSUMPTION.

BY CHARLES W. DULLES, M.D.,

PHYSICIAN TO RUSH HOSPITAL FOR CONSUMPTION; LECTURER ON DISEASES OF THE CHEST IN THE PHILADELPHIA POLYCLINIC.

About 200 years ago (in 1672), Sir Thomas Browne, the author of that famous book, the *Religio Medici*—which every physician ought to read—wrote his almost equally famous "Letter to a Friend upon Occasion of the Death of his Intimate Friend." In this letter there is much curious and interesting writing in regard to consumption, to which disease the subject of it fell a victim. Of him Sir Thomas Browne says that he is "by this time no Puny among the mighty Nations of the Dead; for tho he left this World not very many days past, yet every hour, you know, largely addeth unto that dark Society; and considering the incessant Mortality of Mankind, you cannot conceive there dieth in the whole Earth so few as a thousand an hour."

He describes, in like quaint terms, the symptoms of consumption and the signs of approaching death, and reflects the common opinion as to its mortal character. Once only does he speak of recovery from the disease, when he says: "Monsters but seldom happen, Miracles more rarely, in Physick. Angelus Victorius gives a serious Account of a Consumptive, Hectical, Pthysical Woman, who was suddenly cured by the Intercession of Ignatius."

This view that consumption is almost necessarily fatal has prevailed in and out of the medical profession, and the idea that consumption is incurable is deeply rooted in most men's minds. Of late this idea has undergone some modifica-

¹⁰ Ibid, p. 428.

tion, and careful observers believe—what experience confirms—that consumption is curable. This belief has not yet extended as far as it should for the good of our fellow-men; but it is moving on, and we may hope it will before long do more than it has done thus far to relieve the dark and despondent notions in regard to a disease which is estimated to destroy about one-ninth of the human race.

So strongly, indeed, has the current of medical opinion set toward the belief that consumption can be cured, and that the recent advances in the management and treatment of it are but the earliest of what we may before long accomplish, that there is some risk of overlooking the fact that this belief and this hope are not new on the earth, and that long ago consumption was cured, and the principles that underlie the successful treatment of the disease were plainly enunciated or shrewdly indicated.

If we make due allowance for the uncertainty sometimes caused by the fact that most ancient medical writers used the words phthisis and empyema almost interchangeably, and that their descriptions do not always clearly show that the patients actually had what we now call phthisis pulmonum, it must still appear that even Hippocrates did not look upon the disease as incurable, and that from his time until the present, the possibility of recovery from consumption was fully recognized. Hippocrates, in his wonderful book on *Prognostics* (Sydenham Translation, vol. i, sec. 17, p. 248), describes the progress of what he calls "chronic empyemata," and gives the indications of death, and also of recovery, in terms which leave little room to doubt he was speaking of consumption, or that he looked upon it as sometimes curable.

As one passes down from one to another of the older writers, the same idea can be traced, and cases of recovery may be found recorded—some of persons like Titus Pomponius Atticus, the friend of Cicero, who seems to have had warning in time of the possibilities of his long, small neck and his slender and weak body (Van Swieten's *Commentaries*, sec. 1198), and others like a patient of Hildanus (*Observ. Chirurg.*, Cent. III, Obs. 38), "a lady of quality" who was troubled for many years with a defluxion on her breast, and at last spit up not only blood, but great quantities of purulent matter, and fell into a hectic, with a wasting of the body and loss of strength," who yet, Hildanus says, was cured, and bore several children, although she had never been pregnant before (Van Swieten, sec. 1198).

One of the most interesting illustrations of the curability of consumption is found in the history of Dr. Christopher Bennet, who was born in 1617 and died in 1655. He was himself affected with phthisis, and succeeded in throwing it off, whereupon some of his friends persuaded him to write

a treatise on the subject. He yielded to their persuasions, and wrote his *Tabidorum Theatrum*, which was published in 1665, in London, with a preface by Martin Luellin. In this very rare book, Bennet has given much interesting and instructive matter; and it is no wonder—on the one hand—that he regarded his own disease as curable, nor—on the other—that a man capable of such shrewd observations should warn others against being deceived by false hopes. "A Physician," he says, "ought not to be deceived by the first Flatteries of a Recovery, although there seem to be a perfect Restitution; for it is most safe to continue Means sometime after a Restoration of Health, for fear of a Relapse" (Transl., London, 1720, p. 174). He himself records the case of two patients "who threw up whole pieces of their lungs, which putrefied away by a lingering phthisick." (Op. cit., p. 123.)

Van Swieten records (*Commentaries*, sec. 1209) a case of cure by Philip Ingrassias. The patient was a woman. "After a copious hæmoptoe, she had fallen into a consumption, and for several months afterward not only grew thin, but spit forth fetid pus. When this woman had taken decoctions of *lignum sanctum* (guaiaac) for a month, she was so well recovered, that ten years after, when Ingrassias wrote the account, she was alive, and never had a relapse."

If we come down to our own times or near them, we shall find that the curability of consumption has been recognized by almost all systematic writers.

The late Prof. George B. Wood, in his "Practice of Medicine," says: "I am not one of those who believe that phthisis is in all cases necessarily fatal. On the contrary, I believe that, in one stage or another, it is occasionally cured, or at least ends in perfect recovery." He cites several cases within his own observation which justify this opinion, among them that of his preceptor and friend, Dr. Joseph Parrish, who had symptoms of phthisis when young, and in whose lungs, after his death at an advanced age, cicatrices were found, which were obviously the remains of tuberculous cavities.

Dr. G. W. Hambleton, of London, in an able pamphlet on the suppression of consumption, published this year, declares that we now have it in our power to suppress consumption. And he says there is no essential reason why this should not be accomplished. "Man," he says, "is not born to die from this disease, and, in fact, from four-fifths to six-sevenths of the race do not. We have unquestionable evidence that consumption has been completely recovered from, that a considerable reduction in its amount has been effected in some cases (for example, among prisoners), that it has been arrested for longer or shorter periods, and that persons with the signs of the disease have been able to completely es-

cape from it: consequently we must sooner or later ascertain the means by which that has been effected, and then we shall apply that knowledge to the prevention and cure of this disease."

Elsewhere in his pamphlet he says: "I have the right to express a clear and emphatic opinion on this subject; for I myself and my patients have unquestionably completely recovered from the disease. A great, a splendid, a noble victory over this disease lies in the hands of the profession. Shall we let doubt stand between us and its practical achievement?"

Those of us who have known medical men who are living witnesses to the curability of phthisis will not doubt the truth of what Dr. Hambleton says, or wonder at his earnestness in urging it upon his fellow practitioners.

More than this, we must some of us have some personal observation as to the curability of consumption, and I venture to say that there are but few medical men of much experience who could not cite cases in which the progress of this disease has been arrested, and it has been—using the expression in a just sense—cured.

If you were speaking I am sure you could report such observations, and my own convictions are founded in part on some such fortunate experiences. I have learned in practice what may be accomplished in the management of this dread disease, not only in its incipency, but also when it had made great progress. I have to day several patients going about in apparently good health and free from cough who a few years ago were unmistakably in the beginning of phthisis. No doubt you could say as much. But, to speak of cases much more advanced when they came under my care, I would cite one of a young man with hæmorrhages and free expectoration, whom Dr. Da Costa saw in consultation, and about whom he expressed the gravest prognosis. This young man got so well in about six months that he disdained restraint, despised caution, and brought on a second attack, of which he died. Another patient, almost as plainly doomed to speedy death, seemed well, when he took to drink and died one day after a profuse hæmorrhage, unprecedented by evidences of breaking down of the lung.

Another case was that of a young man who developed with relative rapidity the signs of consumption in 1884. In April he had consolidation in the upper part of the right lung. In June he had a slight hæmorrhage. In July he had a profuse one, followed by several slighter ones at intervals of a few days. During this time he had not much cough. By October he had a profuse greenish expectoration, which was brought up with violent coughing. During the summer his cough had been a source of great annoyance to the near inhabitants of the street on which he lived, and every one of his friends and neighbors

expected him to die soon. He became reduced almost to a skeleton, and in one of his hæmorrhages I was present and held a bowl into which he spit nearly a pint of blood. Notwithstanding all, he began to mend, and progressed until he had regained his usual weight, had no cough at all, ate well, slept well, and had no evidence of disease of any kind, except an insuperable laziness. In this state he lived for four years when, to complete his history, he took to drink and died, as his medical attendant, Dr. George Shoemaker, writes me, "of general breakdown from prolonged intemperance. The immediate difficulty was gastritis, some disease mitral, dilatation, poor compensation, and heart action greatly disordered. The last element caused him much physical and mental distress."

You will notice in this that there is not a word about phthisis. Experiences of this kind, I feel sure, are not peculiar to any practitioner, and the fact that I believe it is such as many other practitioners have had, encourages me to say that, as practitioners, we must not doubt that consumption is a curable disease, and we must not hesitate to encourage our patients to hope that they may be cured.

This is not the time for a discussion of the forms and stages of consumption in which the grounds for a hopeful prognosis are most or least firm. Nor can we now discuss the methods of treatment which give most promise of success. But one thing I think I may say, namely, that an early recognition of danger is usually an important condition of escape, and an early recognition of an incipient consumption is the most important step toward securing its recovery.

In closing, I would like to call attention to the fact that our country seems to be somewhat behind those of Europe in the careful and systematic study of this disease. If we are to contribute our share toward a better understanding of it, we must give more continuous study to it. A great aid to such study is found in certain large special hospitals for consumption in England and in Germany, where more or less conflicting views indeed prevail in regard to some questions of etiology and pathology, but where the most conscientious labor is devoted to investigating the principles of prophylaxis and treatment, and where great success is gained in both these directions.

In this connection I will quote Dr. Hambleton once more. He says: "It is of great importance that the consumptive patient should be placed under treatment as soon as possible, and that it be uninterruptedly continued until the recovery is complete. For this purpose we require hospitals and institutions placed in the most favorable conditions in the country and at the seaside, and I am sure the means will be gladly found for opening these institutions when once

their necessity and immense importance have been realized. With such institutions, so placed, and this system of treatment thoroughly and continuously carried out, I am certain we shall have reduced the mortality from consumption to truly insignificant proportions before the next century has escaped from its infancy."

One thing which encourages the belief that advances in the treatment of consumption and improved sanitary conditions may lead to its eventual disappearance from the world, is to be found in the fact that its ravages have been very materially lessened in the present century. Near its beginning, Dr. Thomas wrote, in his "Practice of Medicine," that the deaths in Great Britain each year were calculated at not less than 55,000 in a population of 11,000,000. This number of deaths has never been passed since then, and in 1888 it fell to 44,248, when the population of England was about 40,000,000, nearly four times as great as when Dr. Thomas wrote. This is a different experience from that of the last century, in which, as Dr. Thomas says, the mortality very considerably increased.

Dr. Flick, of Philadelphia, who has made a careful statistical study of the progress of consumption in England and Wales, has attributed the marked falling off in the death rate from this disease to the establishment and maintenance of special hospitals for the treatment of phthisis and its allied diseases. Such hospitals exist in large number (about forty) in England and Wales, and a certain number are in successful operation in Germany, while others are projected there.

There are already a number of sanatoria for consumptives in this country; but they come very far short of meeting the necessities of the people. In number they are too few, and in scope they are too limited.

The need of the moment, I believe, is a hospital for the careful and systematic study of consumption and its allied diseases—a *hospital*, not a sanatorium or a retreat, where the patients are regarded as incurable, and the duty of the physician is to gently smooth their pathway to the grave, but a hospital, where the study of the disease and of the best means to treat it shall engage the attention of a strong body of men of scientific mind and practical skill.

I am happy to be able to say to you that a hospital for consumption has been established in Philadelphia. This hospital is called the "Rush Hospital for Consumption and Allied Diseases." It has been named in honor of the great American physician who is as conspicuous in the history of medicine in this country as was Franklin in philosophy and political science. To Benjamin Rush this hospital will be, we may hope, a more enduring and more suitable monument than we could raise in brass or marble.

SOCIETY PROCEEDINGS.

American Surgical Association.

(Concluded from page 533.)

THURSDAY—EXECUTIVE SESSION.

The officers for the ensuing year are as follows: President, Dr. Phineas S. Conner, Cincinnati; First Vice-president, Dr. L. McLane Tiffany, Baltimore; Second Vice-President, Dr. Levi C. Lane, San Francisco, Cal.; Secretary, Dr. J. R. Weist, Richmond, Ind.; Recorder, Dr. J. Ewing Mears, Philadelphia; Treasurer, Dr. John B. Roberts, Philadelphia; Member of Council, Dr. Claudius H. Mastin, Mobile.

The committee recommended the following resolution, which was adopted:

Resolved, That the Association hereafter hold each triennial meeting at Washington, and that other annual meetings be held at such time and place as the Association may name.

It was decided to hold the next meeting in Boston, in June 1892.

The following were elected to membership: Dr. J. S. Wight, Brooklyn, N. Y.; Dr. E. W. Walker, Cincinnati, Ohio; Dr. George R. Fowler, Brooklyn, N. Y.

The following honorary members were elected: Mr. John Chiene, Edinburgh; Mr. Reginald Harrison, London; Mr. Thomas Bryant, London; Mr. Arthur Edward Durham, London.

THURSDAY SESSION.

DR. FREDERICK S. DENNIS, of New York, read a paper on

RECURRENCE OF CANCER OF THE BREAST.

Only those cases were included in which a microscopical examination of the tumor has been made; the necessity of an investigation of carcinoma of the breast is shown by the fact that in England alone 7,000 deaths occur annually from carcinoma, and a large proportion of them are cancer of the breast. It has been demonstrated that cancer is a disease which is slowly increasing in civilized nations. A study of the subject shows that there are 75 per cent. of recurrences. These cases include cases of incomplete operation, *i. e.*, when axilla has not been opened. In the primary growth at the beginning, the neoplasm is of local origin. Early and complete removal of the growth relieves the local disease, but the operation does not relieve the predisposition or susceptibility or the capability for the recurrence of the disease. It is possible that the capability is limited to certain extent.

The recurrence of carcinoma of the breast is influenced first by the period of time from the appearance of the growth to the date of the operation. In the cases of the author in which the cure had continued for three years or more, the tumors were removed on an average six months

from the date of their first recognition in the breast. In all cases of permanent cure, the axillary glands were not invaded.

Recurrence is influenced, second, by the extent to which infiltration has taken place by any one or all of the three well recognized ways of dissemination. When the tumor has existed long enough to show extension in these directions, the growth has been of long duration.

Third, recurrence is influenced by the radical character of the operation itself. Complete removal of the breast is essential. The method of Mr. Stiles of Edinburg, by which the tumor after removal is treated with dilute nitric acid in order to show whether or not the incisions have been made in healthy structure and all the diseased structure has been removed, was described. The reported mortality of the operation is high, but in the author's 71 cases there had been but one death and that was from continued bleeding in hæmophilia.

Fourth, recurrence is influenced by the histological character of the carcinoma itself. Where the structure differs slightly from the normal the clinical history is favorable. In none of these cases was there recurrence. Where there is great departure from the normal type, the clinical history is unfavorable. The more embryonic the structure the greater the chance of recurrence.

Fifth, the recurrence is influenced by the simultaneousness in both breasts. This occurs in five per cent. of the cases. These patients are very liable to recurrence.

Sixth, recurrence is influenced by the personal factors of the individual, such as age, sex, marriage, fecundity, sterility, pregnancy, traumatism, heredity, menstruation, metastasis, mental condition, locality, etc.

Seventy-one cases of carcinoma of breast which had been operated on were referred to. In one there had been death from hæmophilia. In nearly all the axilla was opened. The operation consisted of excision of the entire breast, with all contiguous skin, the para and peri-mammary, fatty areolar tissue, the pectoral glands, the pectoral fascia and also removal of the axillary glands and fatty axillary tissue. In some cases the supra clavicular glands were removed, and in one case excision of the ribs was done. The percentage of permanent cures amounted to 30 per cent. The other held that with early and radical operation, recurrence of carcinoma of the breast will be comparatively rare.

MR. THOMAS BRYANT, London, believed firmly in the local origin of carcinoma, although we must admit that there may be a predisposition on the part of the patient to the development of the disease. The disease should be treated at an early period, and this brings us to the question of diagnosis. Many cases do not come under observation until the disease is well advanced, because

the patient imagines that a disease unassociated with pain cannot be cancer. Where induration appears in a breast during the period of functional activity there may be some hesitation in the diagnosis, but in some thirty cases of this kind he had recommended immediate operation, and in all the cases, the disease was shown to be malignant. In none has recurrence taken place. When the disease has advanced somewhat further with dimpling and puckering of the skin and some immobility, we may get a good result by making a thorough operation. He had had some cases without recurrence for from five to twenty years. In the more advanced cases the surgeon should limit his operations to those in which there was a reasonable prospect of removing all the diseased structure. He does not remove the axillary glands in every case. If the glands be enlarged or the disease extend upward in that direction he removes the glands thoroughly; where the disease is quite local, and there is no evidence of axillary involvement, the axilla is not opened. In the atrophic form of cancer he thought it better not to interfere unless the tumor was giving rise to great inconvenience. Operation in these cases is often followed by a more rapid form of growth. Again in that form of cancer where the lymphatics can be traced distinctly, and the breast has a brawny feel—the lymphatic form of cancer—the surgeon does no good by interference.

SIR WILLIAM McCORMAC, London, thought that the axilla should be opened in operations for carcinoma of the breast for two reasons, viz.: an examination of 117 cases of cancer of the breast showed that in all but two there was axillary involvement, and second, in ninety per cent. of the recurrence the disease appears in the axilla.

DR. LEWIS S. PILCHER, Brooklyn, thought that the term "recurrence" was not applicable to many of these cases, and that in many the disease was simply a continuance of the former growth. If the case goes one year without the appearance of return of the disease, it may be considered that the disease has been removed, and if it appears later, it can be regarded as a recurrent, a renewed or a new attack of cancer. In every case of cancer there is a predisposition to the disease, and we should search for some agent to counteract this constitutional predisposition which we can use in addition to operative measures. Arsenic has for many years been used for this purpose. Dr. Wight of Brooklyn has suggested the use of carbonate of lime for the same purpose.

DR. L. McLANE TIFFANY, Baltimore, did not think that we could set any limit to the time of which recurrence might take place. He had had the disease return eight years after operation. He was a firm believer in the local origin of cancer. The date at which the disease is recog-

nized varies much. In some the disease comes before the surgeon shortly after its commencement, while in others the tumor has reached considerable size. The time at which the disease is discovered by the patient, bears no relation to the time of its commencement. Too much stress had not been laid on the necessity of thorough operation. In only two cases out of 80 operations for cancer of the breast had he found the axillary glands not enlarged. The pectoral fascia should be removed, and at times portions of the muscle should be cut away.

DR. KINGSTON, Montreal, believed that cancer was essentially a local disease. If we believe this operation should be done at as early a date as possible, the glands should be removed not only from the axilla, but from its neighborhood if they are enlarged, but this should not form a necessary part of the first operation. Such a procedure adds greatly to the discomfort and to the danger. Where there is the slightest suspicion of involvement of the glands, they should be removed. If there should be recurrence the operation should be repeated as often as circumstances seem to warrant.

DR. JOSEPH RANSOHOFF, Cincinnati, reported thirty cases of removal of the breast for cancer, without a death. He thought the danger of the operation was not materially increased by opening the axilla.

DR. C. B. NANCREDE, Ann Arbor, said with reference to the three year limit that this had been proven to exclude 98 per cent. of the recurrences. It is impossible to tell whether or not the axillary glands are involved without opening the axilla. Unless this is done the majority of the cases will be left unbenefited. He advised that the axilla be opened first and if the glands could not be removed to close the wound and not remove the breast.

DR. J. R. WEIST, Richmond, Ind., had operated fifty-five times for cancer of the breast and makes it a rule to open the axilla in every case.

DR. GEORGE W. GAY, Boston, felt that there was no such thing as a local origin of cancer as we have the local origin of a fatty tumor. When it can be shown that a cancer taken out will not return just as a fatty tumor when removed does not return, then we can prove the local origin of carcinoma.

DR. EDWARD M. MOORE, Rochester, always operates in as thorough a manner as possible. He always opens the axilla and did not think that it added to the risks of the operation. He did not agree with Mr. Bryant in regard to the atrophic cases in old individuals. In these he recommended operations considering recurrence very improbable. He reported one case living seventeen years after operation, and now seventy-nine years of age.

DR. C. B. PORTER, of Boston, then read a paper on

A CASE OF DIFFUSE FIBROMA WITH A TENDENCY
TO INTRACANALICULAR GROWTH OF
BOTH BREASTS.

Mrs. M., æt 37 years, resident of Nova Scotia, was admitted to the Massachusetts general hospital. Has had two children, the youngest ten years old. Three years ago she discovered a hard lump in the right breast which gradually increased in size. Three months later the left breast commenced to enlarge. The breasts continued to slowly enlarge until three months ago when a rapid increase took place and the breasts soon became burdensome by their size and weight. On examination she was found to be pale, emaciated, and with ovarian pains. Right breast, largest circumference 38 inches; length from chest wall to nipple 17 inches; circumference at base 23 inches. Left breast, largest circumference 28 inches, length from chest wall to nipple 14 inches; circumference at base 23 inches. Throughout both breasts were felt movable hardened masses of irregular outline, varying in size from an orange to a closed fist. It was decided to remove the left first. The breast was transfixed at the base with two skewers and constricted below this with a tightly drawn rubber tourniquet. The breast was then removed and but little blood lost. Three weeks later the right breast was removed. Twenty days after the second operation the patient was permitted to leave the hospital to visit friends, but instead she returned to her home, requiring a long sea journey. A week later she developed erysipelas. This had much improved in four days when she suddenly aborted a five months' fœtus.

The weight of the right breast after removal was 43 pounds, and that of the left 17 pounds, a total of 60 pounds. A resumé of the reported cases was added.

DR. J. M. BARTON, of Philadelphia, reported a similar case on which he had operated, and in which one breast was involved. Adjourned Thursday.

FRIDAY MORNING.

The committee to which was referred the suggestions in the President's address offered the following resolution, which was adopted :

Resolved, That the President appoint a committee with authority to confer with the friends and admirers of Professor S. D. Gross, and with the profession at large, for the initiation of a movement on the part of the Association, having for its object the erection of a monument to Dr. Gross in the City of Washington.

As the matter is an important one, the President stated that he would announce the committee in a few days.

DR. LEWIS A. STIMSON, of New York, read a paper on

TREATMENT OF FRACTURES INVOLVING THE ELBOW-JOINT.

The special interest of the subject arises from the frequency with which fractures of the lower end of the humerus are followed by more or less diminution of the function of the elbow-joint, and by deformity of the region or of the limb. The paper was devoted mainly to a consideration of the causes of these unfavorable results.

Causes of limitation of motion. Permanent stiffness after simple fracture is commonly due to change in the shape of the articular surfaces or in their relations to one another, that destroys the coincidence of the axis of curvature with that of motion; or to an overgrowth of bone upon the surface of the humerus, arresting the movement of the olecranon or coronoid process; or to more or less extensive ossification of the ligaments and capsule.

Overgrowth of bone from traumatism is more frequent in the young than in the adult. As limitation of motion may be caused by bony outgrowth from the humerus, itself the result of a persistent displacement of a fragment or of separation of the periosteum, the most efficient way to prevent it lies in an exact diagnosis and reduction of displacement, and in the avoidance of any subsequent irritation of the periosteum.

Limitation of motion from thickening of the capsule and periarticular tissues by the products of inflammation is, as a rule, a temporary condition. In the more permanent form, the lesions are more extensive, the soft tissues are torn, and a true cicatrix results. The thickened tissue may become ossified in whole or in part. This cause of limitation has been attributed, but improperly so, to prolonged immobilization, and has led to the practice of passive motion in the early stages with the object of preventing its occurrence. Observation and experiment have, however, shown that immobilization is not itself a cause of ankylosis, but that it is an efficient agent against inflammation, and that passive motion is powerless to prevent ankylosis when conditions contributory thereto are present. Passive motion, therefore, is either harmful or useless. The primary cause of the exudation and of the proliferation of connective tissue that are the anatomical obstacles to motion, is of course the original traumatism. The secondary cause is the following reaction. The only factor that can be increased or diminished by treatment is the second—that is, the inflammatory reaction. Rest is universally admitted to be the best antiphlogistic measure that can be applied to an inflamed joint. An important disadvantage of rest at once suggests itself, namely: that the torn tissues may unite with shortening. Both clinical observation and theoretical considerations indicate that passive motion in the early stage does not avoid this disadvantage, but actually in-

creases it. In the present state of our knowledge, it seems that a certain amount of limitation is unavoidable. Massage, however, hastens the absorption of exudation and the restoration of mobility, as does also permanent elevation or suspension of the limb. Reunion with shortening may be opposed by change in the attitude of the limb every few days. At a later period passive motion has its value, but in the early stages it is to be avoided.

In regard to deformity, reference was made to only one, that commonly known as the "gun stock" deformity, due to unreduced displacement of the internal or external condyle. In order to avoid this deformity, the displacement should be reduced by pressure upon the fragment or by abduction of the extended forearm until its outward deviation is equal to that of its fellow, and immobilization by dressings that will not reproduce the displacement.

Treatment.—The first element in the treatment is the reduction of the displacement. If necessary, an anæsthetic should be employed. In supra-condyloid fractures, permanent traction is usually necessary to overcome the displacing action of the flexors and extensors. This can be effected by vertical suspension of the limb, the patient being kept in bed, or by a weight suspended from the upper part of the flexed forearm while the patient is erect. The former method was recommended for the first fortnight of treatment, especially in compound fractures. Suspension is made by strips of adhesive plaster placed along the front and back of the forearm, and attached to the support of India rubber cords, or a weight and pulley. In simple fractures, the other method may be employed. The limb is encased in plaster of Paris with the elbow at a right angle, the wrist being placed in a sling, and a weight not exceeding 5 lbs. suspended from the elbow.

In inter-condyloid fractures with marked separation, there is no practicable means of surely maintaining reduction, and considerable limitation is to be expected. In these cases, a broad, heavy posterior splint, covering about two-thirds of the circumference of the limb, the elbow being at a right angle, was recommended.

In fracture of either condyle, the treatment is by a posterior rectangular splint, either metal or plaster. The forearm has been supported across the chest by a sling at the wrist. In some cases treatment in full extension has been employed. After this method has been employed for the first ten days or fortnight, recourse is had to the position with the elbow at a right angle.

Gentle massage will hasten convalescence. It may be advisable to change the position of the limb during treatment, and if great limitation is to be expected, that attitude should be given to the joint in which, if stiff, the usefulness of the limb will be greatest. In supra-condyloid and

intra-condyloid fractures, the splint should be worn six weeks, and in fractures of the condyles, for about four weeks. After removal of the splint, the arm should for a few days be supported in a sling. If necessary, passive motion may at this time be resorted to to increase the range of motion.

DR. N. P. DANDRIDGE, of Cincinnati, agreed with what had been said by the reader of the paper, and referred to two cases occurring under his observation. In one case of simple fracture from great violence in which non-union had occurred, the arm was treated in a position of almost complete extension. The second case was one in which after fracture at the elbow joint a projection of bone pressed upon the median nerve, causing severe pain and atrophy of the muscles in the distribution of the nerve. The case was seen three months after the accident. Removal of the bone was followed by relief of the pain and a gradual restoration of the function of the muscles.

DR. R. A. KINLOCH, of Charleston, thought that in simple fractures about the elbow, if seen early and the ordinary principles in regard to the treatment of fractures be applied, the result would be good. Probably in a large number of cases we must expect some restriction of movement. The most important element in the treatment is the proper reduction of the fragments. This should be done at once, an anæsthetic being employed if necessary. The proper reduction of the fragments is determined by testing the functions of the joint. The second indication is to retain the fragments in the proper position. If the case is treated with intelligence, it makes little difference what way the splint is applied, or whether it is treated in flexion. The position is to be determined largely by the peculiarities of the individual case. He was himself inclined to favor the extended position.

In regard to passive motion used early, he thought that it did more harm than good. If the parts have been properly reduced and held in position, and there is a danger of subsequent trouble, passive motion may begin in three or four weeks.

DR. E. M. MOORE, Rochester : In a fracture of the internal condyle the cause of the displacement is the flexor muscles, and to relax these muscles the arm is to be placed in the flexed position. In fractures of the external condyle he had also found this position the preferable one, for when the forearm is flexed the dense fascia on the front of the arm is rendered tense and acts as an efficient splint. He objected to the extended position entirely. He treats all fractures about the elbow joint, with the exception of fractures of the olecranon, in the rectangular position for the first ten days or two weeks. Lateral splints are used with the object of pressing the frag-

ments together. After the tenth day the fracture is dressed every other day, the angle of the splint being changed a little each time, so that the arm passes from almost complete flexion to almost complete extension. He had never had the slightest difficulty in any case since adopting this mode of treatment.

DR. JAMES M. CANN, Pittsburg, said that it was not always easy to determine the exact nature of these fractures about the elbow joint, even with the patient under the influence of an anæsthetic. While the patient is under the anæsthetic the preliminary dressing should be applied. He recommended the use of the internal angular splint, preferably that suggested by Dr. Packard. He did not favor the use of passive motion at an early stage. Passive motion should not be resorted to prior to the twentieth day.

DR. JOHN B. ROBERTS, Philadelphia, thought that the teaching advocated by some of the speakers was to a large extent dangerous and incorrect. That is, that injuries about the elbow joint should be treated in the flexed position. He believed that, except in unusual cases, these fractures should be treated in the extended position, according to the doctrine advocated by Dr. Allis. In this way the gun-stock deformity is avoided. He now approached fractures of the elbow with the same certainty of getting a good result as he did fractures of the lower end of the radius.

DR. S. H. WEEKS, Portland, dwelt upon the fact that all authorities, with few exceptions, advised the flexed position in the treatment of fractures about the elbow joint. Until there was more positive evidence of the value of the extended position he thought it better to continue to treat these fractures in the flexed position. He employed passive motion in a modified way. After two weeks' treatment the splints are removed and the joint moved gently but not sufficiently to cause pain. This simply alters the relations of the parts without doing any damage.

DR. L. McLANE TIFFANY, Baltimore, thought that as good results were reported from various dissimilar methods of treatment, we must conclude that the prognosis of elbow injuries depended more upon the patient than upon the surgeon. Fracture of the elbow is rare in adults and common in children, and in children, with reasonably good treatment, there should be a good result, and by the time adult age was reached the motion would be almost perfect. In the adult the prognosis is more grave. He had had good results both with the flexed and with the extended position. In compound fractures, the secret lies in the relief of tension, irrespective of the apparatus employed. Incision up and down the arm through the strong fascia should be made as freely as may be required.

ALBERT VANDERVEER, M.D., of Albany, read a paper on

RETRO-PERITONEAL TUMORS, THEIR ANATOMICAL RELATIONS, PATHOLOGY, DIAGNOSIS AND TREATMENT, WITH REPORT OF CASES.

As our experience in abdominal surgery increases we find that there are yet many problems that confront us, and of these problems there are none which requires more careful research and is capable of greater improvement both in operative management and in prognosis, than new growths arising from the retroperitoneal space. In order to bring this subject more fully to the attention of the association, the following cases are reported:

Case 1.—Miss S., æt. forty-two years, consulted the author in March, 1882, on account of a tumor located in the back. This was first noticed fifteen years previously. Examination showed a large tumor attached to the right side of the spine at the level of the first lumbar vertebra. It seemed attached to surrounding tissues of a smooth contour and hard to the touch. Operation was advised but declined. The tumor continued to increase in size until November, 1888, when she died from other causes. The autopsy showed the origin of the growth to be the connective tissue about the right kidney. It was encapsulated and could have been easily removed. It weighed eight pounds. The microscope revealed the presence of fat and myxomatous tissue with an abundant small round cell infiltration.

Case 2.—Mr. V., æt. 41 years, married, was first seen May 28th, 1889. Five years ago strained his back. The pain following this has not been relieved by any treatment. Three months ago he became worse, the abdomen began to enlarge. The pain was more severe. He lost appetite and flesh. The ankles became œdematous and a distressing cough developed. The urine was scanty and high colored, but free from albumen and casts. The abdomen was more prominent on the right side. Fluctuation could not be elicited but palpation gave an impression similar to that of a lipomatous tumor. On the right side there was flatness from the nipple to the crest of the ileum with the exception of a narrow space along the border of the ribs where there was a zone of resonance. The probability of the growth arising from the kidney was strong and an exploratory abdominal section advised.

This was done June 1, 1889, an incision five inches long being made over the external border of the right rectus muscle. The growth was reached and the capsule divided, but from its attachments it seemed futile to attempt its removal. The patient recovered from the operation and for a considerable period was relieved of pains. The growth continued to increase in size and the patient died October 21, 1889.

The tumor, which weighed fifty-six pounds, originated behind the peritoneum and was attached to the right kidney. The microscope showed it to be an adipose tumor presenting a condition of myxo-sarcoma with sarcomatous infiltration.

Case 3.—Mr. N., æt. thirty-nine, a brass worker by occupation, began to have vague abdominal symptoms late in the year 1888 with failure of flesh and strength. In June, 1889, he developed jaundice and a tumor was found in the left hypochondriac region and lumbar region. This was as large as a child's head. An exploratory operation was advised, but refused. It was believed that the growth was connected with the left kidney. The tumor continued to grow and in November, 1889, the patient died. The tumor was found to have sprung from the region of the left suprarenal capsule and involved it. It also surrounded the kidney. It weighed six and one-eighth pounds. The microscope showed an appearance similar to that in case two, but with a greater preponderance of sarcomatous and myxomatous elements.

A careful study of the reported cases and of the literature of the subject impresses one with the belief that the most frequent origin of these growths is in the connective tissue of the capsule of the kidney, and that the next most frequent seat is the supra-renal capsule. None of these tumors can be said to be absolutely benign, even those which are made up entirely of histological elements, such as lipoma fibroma, or myoma. While they show no great tendency to recurrence after complete removal, yet from the great size to which they develop and their tendency to undergo degenerative changes, they cannot be classed as innocent growths.

In many of the reported cases the origin is not stated, and indeed it would, from the subsequent changes in anatomical relations, seem quite impossible to determine the exact origin of many of the large retro-peritoneal growths. They almost always present themselves in the line of least resistance, that is anteriorly. A careful study of these tumors shows them to be of a mixed variety, containing both the elements of the lipoma and myxoma tissues which are histologically very closely associated. Fat is developed from embryonal mucin and in post-fœtal life occupies those spaces in the economy which later in the fœtus is of myxomatous elements. Doubtless many of these growths arise under suitable conditions. From congenital neoplasms these growths often become cystic and reach immense proportions. They often present a numerous round celled infiltration pointing to a sarcomatous element. Sarcoma, either in its typical form or in combination with other tissues, often occurs.

Diagnosis.—There is not a single symptom

that is pathogenic and the diagnosis is more dependent upon the process of exclusion. Tumors of the other abdominal and pelvic organs, as well as aneurisms and tumors of the abdominal wall, must be excluded. As already stated many of these tumors have their origin in the capsule of the kidney or the connective tissue surrounding it. These present, in their earlier stages at least, physical signs differing in no respect from tumors of the nephritic parenchyma. In none of the cases reported has renal hæmorrhage or albuminuria, with or without casts, occurred, conditions which are the rule with tumors of the parenchyma of the kidney. A valuable adjunct in the diagnosis consists in noting the relation of the tumor to the intestinal tube as shown by the asufflation of hydrogen gas.

Prognosis. — Without operative interference there is but one termination. The rapidity with which the fatal result is reached varies with the character of the growth. The mean duration of life after the discovery of tumor is about nine months. Operative treatment offers much promise; the immediate mortality of the operation is great, yet from the hopelessness of the condition it is to be urged with great earnestness.

In operations for the removal of retro-peritoneal growths, the choice of incision will usually fall in the line of the linea semilunaris. By the separation of the peritoneum from the internal border of the tumor, it may be attached to the internal border of the abdominal wound, making the whole field of operation extra-peritoneal, the incision of the posterior fold of the peritoneum should be external to the attachment of the mesentery of the colon, although not absolutely necessary. In the removal of the growth by nucleation, care should be taken to determine the source of the blood supply and the relation of the great vessels. There are likely to be large thin-walled veins deep in the wound, requiring ligature. At times it will be found necessary to remove the kidney with the tumor. As in all abdominal work the operator should be prepared for any and every complication. After nucleation the cavity must be thoroughly drained. The after treatment is the same as in all other severe abdominal sections.

Like all other conditions in surgery, there is certainly a better understanding of these cases going on. A more correct and early diagnosis, as is the case in all that pertains to medicine and surgery, will surely bring a larger percentage of cures.

These are purely surgical cases. No medicines, no mineral waters or baths, electricity or other means of therapeutics, having as yet been of any service. To the paper was appended a complete bibliography of retro-peritoneal new growths.

DEFOREST WILLARD, M.D., of Philadelphia, read a paper on

INTRA-THORACIC SURGERY.. BRONCHOTOMY THROUGH THE CHEST WALLS FOR FOREIGN BODIES IMPACTED IN THE BRONCHUS.

DR. WILLARD gave the results of a number of experiments on dogs, in which an opening was made in the chest walls, one or more ribs excised, and the bronchus thus reached, either anteriorly or posteriorly. The operations were all fatal.

The following conclusions were presented:

1. In dogs, the bronchus can be reached either anteriorly or posteriorly through the chest walls, but the anatomical position is in such close proximity to large and important structures, that safe incision is a matter of extreme difficulty and danger.

2. Bronchotomy through the walls of the thorax is an operation attended with great shock from collapse of the lungs, and until the technique is farther advanced, is liable to result in immediate death.

3. Collapse of the lung is more serious in a healthy organ than in one physically crippled by disease.

4. The serious inherent difficulties are shock, suffocation from lung collapse, enormous risks of hæmorrhage from pulmonary vessels, injury of or interference with the pneumogastric nerve, great and fatal delays, owing to the exaggerated movement of the root of the lung caused by the excessive dyspnoea.

5. Closure of the bronchial slit is slow and dangerous. To leave it open causes increasing pneumothorax, by its valve action, and also permits the entrance of septic air into the pleural cavity.

6. Although a foreign body can be reached by this route, yet removal is hazardous. To secure a subsequent complete cure seems, in the present state of knowledge, very problematical.

7. When the presence of a foreign body in the bronchus is definitely determined, and primary voluntary expulsion has not been accomplished, there is great danger in permitting it to remain, even though it may but partially obstruct the tube. The risks both of immediate and of subsequent inflammation are serious.

8. Low tracheotomy is then advisable when the presence of a foreign body is certain. It adds but little to the risks, and affords easier escape for the object, even when extraction is not feasible.

9. *Subsequent dangers arise from severe and prolonged instrumentation; not from tracheotomy.*

10. Voluntary expulsion is more probable after than before tracheotomy.

11. Tracheotomy is permissible even after an object has been long in position, unless serious lung changes have resulted.

12. The question of tracheotomy will depend

largely upon the form, size and character of the foreign body.

13. The term bronchotomy should be limited to an opening of the bronchus, and should not be employed to designate higher operations.

14. The risks from thoracotomy and bronchotomy following unsuccessful tracheotomy are much greater than the dangers incurred by permitting the foreign body to remain.

DR. J. R. WEIST, of Richmond, said that from a study of one thousand cases in which a foreign body was impacted into a bronchus, he had reached the conclusion that the chances of the patient were better if left alone than if an operation of what was formerly called bronchotomy was done.

DR. S. H. WEEKS, of Portland, thought that in these cases tracheotomy should be performed, as this affords a chance of reaching the foreign body, and also offers a chance for the spontaneous expulsion of the body. It occasionally happens that the body is forced up against the vocal cords and then falls back, or else suffocates the patient before relief could be afforded. He reported the case of a child of ten years, who had so gotten into the trachea a screw cap that was used to close a pocket flask. It had been there several days before the patient came under observation. It was decided to open the trachea. This was done, and the patient suspended, but the foreign body did not escape. The patient was then placed in the horizontal position and the attempt made to remove the cap with forceps. It could be felt, but not grasped. After working unsuccessfully for some time, the patient was again suspended and the attempt with the forceps renewed, and at once the body was grasped and removed. The patient made a perfect recovery.

DR. KINGSTOWN, of Montreal, reported a case in which he had removed an artificial incisor tooth with its attachments from the trachea where it had remained for three months. The operation necessitated prolonged manipulation but was followed by no bad results.

DR. HOWARD MARSH, England, thought that on account of the danger of leaving the foreign body in the bronchus, the uncertainty in regard to the possibility of removal until the attempt is made, and the safety of tracheotomy, the operation should be performed. The operation should be performed in all these cases as it gives the patient a chance where otherwise he perhaps has none.

MR. ARTHUR EDWARD DURHAM, of London, agreed with the author of the paper that the operation through the chest wall was a dangerous and doubtful procedure. The more he saw of these cases the more satisfied was he that the proper thing to do where there is clear evidence that a foreign body is impacted in the bronchus, is to open the trachea low down and endeavor to

remove the foreign body or to facilitate its spontaneous expulsion. This opinion was the result of considerable experience.

DR. LEWIS A. STIMSON read a paper on
OLD UNREDUCED DISLOCATIONS OF THE ELBOW.

The following papers were read by title:

"Fractures Involving the Upper Third of the Femur Exclusive of the Neck," by DR. O. H. ALLIS, Philadelphia.

"Fractures of the Bones Which Form the Elbow Joint, and their Treatment," by DR. LEVI C. LANE, San Francisco.

"Hemiplegia with Aphasia, Following Ligation of the Common Carotid Artery," by DR. J. EWING MEARS, Philadelphia.

"Investigation of Pistol-shot Wounds of the Skull and their Treatment," by DR. E. H. BRADFORD, Boston.

"The Results of Experiments in the Filling of Cavities of Bones Following Operations for Caries," by DR. E. H. BRADFORD, Boston.

After extending a vote of thanks to the retiring President, the Association adjourned to meet in Boston, Mass., in June 1892.

BOOK REVIEWS.

HEALTH REPORTS.—1. *Eleventh Annual Report of the State Board of Health of New York*. Vols. I and II. Paper. Pp. 935. Octavo. Albany: Jas. B. Lyon.
2. *Thirteenth Report of the State Board of Health of Wisconsin*. Paper. Pp. 150. Octavo. Madison: Democrat Printing Company.

Twenty years have elapsed since the creation of the first State Board of Health in the United States, in Massachusetts, and from that single beginning, State after State has fallen into line, until nearly every State in the Union has its board of health in more or less active operation, according to the appropriations granted them by the various legislatures.

The reports show careful and conscientious work, in furnishing information to municipalities within their boundaries, and the New York report is especially valuable on account of the complete directions given for the sewerage of certain villages and the disposal of the sewage, and rules and regulations for the water supplies of certain others. The treatment of these topics may well serve as a model for similar work elsewhere.

The Wisconsin Board was hampered in the publication of its report by the parsimony of its legislature. The board reprints in its report, with favorable comment, the resolution of the conference of State boards on the subject of the great destruction of forests now going on and the means of prevention of the deforestation. This subject is one of growing importance, not only from the standpoint of the sanitarian, but as well from that of the publicist. The general encouragement of tree planting and the laying out of public parks is needed in every State in the Union.

THE

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MEMBERSHIP IN THE AMERICAN MEDICAL ASSOCIATION.

This is obtainable, at any time, by a member of any State or local Medical Society which is entitled to send delegates to the Association. All that is necessary is for the applicant to write to the Treasurer of the Association, Dr. Richard J. Dunglison, Lock Box 1274, Philadelphia, Pa., sending him a certificate or statement that he is in good standing in his own Society, signed by the President and Secretary of said Society, with five dollars for annual dues. Attendance as a delegate at an annual meeting of the Association is not necessary to obtain membership. On receipt of the above amount the weekly JOURNAL of the Association will be forwarded regularly.

SATURDAY, OCTOBER 10, 1891.

TOXICITY OF THE URINE—ITS DETERMINATION AND CLINICAL IMPORTANCE.

Speaking generally, acute febrile processes in the present state of our knowledge, may be divided into two classes, those in which the febrile reaction, with its accompanying nervous manifestations, particularly brain symptoms, is due to the presence in the body fluids of soluble poisons, intoxication; and, secondly, those cases in which the febrile reaction or nervous manifestations are due to, or at least are accompanied by, distinct structural changes. How far the second class of cases may be hereafter shown to belong to the first class it is not our present purpose to discuss. Perhaps it would be better to present the same classification in different terms, and say that there are acute cases in which the symptoms may be made to disappear, promptly and completely, by active eliminative measures, and, secondly, cases in which elimination fails to relieve.

In practice it is difficult and often impossible to differentiate the two classes, and resort to therapeutic measures must be had to determine the diagnosis, measures which, it is needless to say, are highly unscientific so far as diagnosis is concerned, and while often satisfactory, by no means always so.

In the first or toxic class the poisons producing the symptoms will be wholly or in part elimi-

nated by the urine, and examination of this fluid ought to determine the diagnosis at once. And so it would if it were possible to make the examination. But many of the poisons producing the most intense symptoms act in quantities so small as to defy chemical detection in the urine. Again, these poisons are exceedingly numerous, and many of them as yet unknown, and to examine the urine for even the known ones would be a work scarcely possible, even to the trained chemist, with properly equipped laboratory and abundance of time. Moreover, the qualitative recognition of the poisons is not enough, some idea must be had as to their quantities. What is needed, then, is some general reagent by means of which may be quickly determined, first, that the urine is toxic; second, the degree of toxicity; third, the kind of toxicity.

With the present equipment this reagent is not to be found in the chemical laboratory, but is to be sought in the biological laboratory. The reagent which answers the requirements is the animal organism.

SEMMOLA, following the suggestion originally made by BOUCHARD, has recently made some interesting observations in this direction, and in the *British Medical Journal* of Sept. 19, 1891, reports two cases which illustrate singularly well the clinical importance of such studies. The first case was that of a phlegmon in the right arm of a man aged 70, with serious general and especially cerebral symptoms. Some of this patient's urine was injected into a rabbit with the effect of reproducing the toxic symptoms in a more serious form than in the human patient. This demonstrated the toxic character of the attack and enabled him by way of prognosis to foretell that improvement would take place when the uro-toxic coefficient of the urine was diminished, in spite of the fact that, owing to an intercurrent attack of diarrhoea, the patient's general condition seemed to be worse, and when the clinical prognosis was therefore doubtful. By way of treatment he ordered copious draughts of sulphuric lemonade with the object of destroying the circulating ptomaines, and favoring their elimination.

"In the second case—one of fibrinous pneumonia following influenza—whilst the specific inflammatory process successively invaded new zones of pulmonary tissue, there supervened,

suddenly, eclampsia and tetanoid symptoms, which made the medical attendant suspect the onset of infective cerebro-spinal meningitis. The condition of the patient was most serious; a temperature of 40.07° C. (104° F.) pulse 125, respiration 55; fluid yellowish green expectoration, profuse sweating, etc., in short the classic picture of a most violent acute infection. . . .

I did not however feel justified in accepting without much reserve the diagnosis of cerebro-spinal meningitis, and before giving my opinion I caused experiments to be made in the laboratory of my Clinical institute, on the biological analysis of the urine which the patient had passed in the last twelve hours. . . . The injection of 5 c. c. of the urine into a guinea-pig weighing 250 grams, and 10 c. c. into a rabbit weighing 1,050 grams, was immediately followed by general tremors, alternating with tonic convulsions and extreme dyspnoea, exactly resembling the clinical symptoms and convulsions seen in the patient, and clearly showing that part of the dyspnoea, the severity of which was certainly disproportionate to the extent of the pneumonic process, was of bulbo-paralytic origin. I no longer hesitated as to the diagnosis, but declared that the convulsions did not indicate an attack of cerebro-spinal meningitis, but simply a most acute intoxication, due to the formation of new special ptomaines in that great and mysterious biochemical laboratory of which the human organism, when attacked by influenza, is the seat." A more favorable prognosis was made and the patient put on large doses of sodium iodide as a means of elimination. Within twenty-four hours the convulsive attacks ceased, and the urine passed after their subsidence, although the pneumonic process continued with hardly any appreciable improvement, and the temperature persisted at 104° F., showed itself on biological analysis to be inoffensive. In fact the injection of 90 c. c. into a rabbit did not induce the slightest toxic manifestation referable to the classic clinical type shown by the patient.

MISCELLANY.

AMERICAN PUBLIC HEALTH ASSOCIATION.—The nineteenth annual meeting will be held at Kansas City, October 20 to 24, 1891. The Local Committee of Ar-

rangements announces that all the Railway Passenger Associations of the country have granted a one and one-third fare rate for the round trip, on the usual certificate plan, that is: 1. Procure a certificate of attendance from the agent at the starting point by paying full fare to Kansas City. 2. Have the certificate of attendance signed by the proper officer of the Association at Kansas City. This certificate will then procure return ticket for one-third fare. All the leading hotels of Kansas City will give special rates to delegates. Arrangements are being perfected for an excursion into Kansas, as one of the features of the entertainment of the Association. For any information as to the meeting, address Dr. E. R. Lewis, Chairman, or Dr. Joseph Sharp, Secretary, Local Committee of Arrangements, Kansas City, Mo.

THE MISSISSIPPI VALLEY MEDICAL ASSOCIATION meets next Wednesday morning at the Pickwick Theatre, in St. Louis. The indications are that the meeting will be very much the largest ever held by this banner organization.

DISTRICT MEDICAL SOCIETY OF CENTRAL ILLINOIS.—The Semi-Annual Meeting of this Society will be held in Vandalia, Ill., on Tuesday, October 27, 1891.

Officers.—President, G. W. Fringer, M.D., Pana; First Vice-President, W. G. Wilson, M.D., Shelbyville; Second Vice-President, Wm. H. Sparling, Moawequa; Secretary, J. H. Miller, M.D., Chicago; Treasurer, F. B. Haller, M.D., Vandalia.

Board of Censors.—W. J. Eddy, M.D., Shelbyville; J. Huber, M.D., Pana; W. W. Murfin, M.D., Patoka; Jno. A. Prince, M.D., Springfield; Amos Sawyer, M.D., Hillsboro.

PROGRAMME.

Tuberculosis, W. J. Eddy, M.D., Shelbyville.

Movable Kidney and Hydronephrosis, David W. Graham, M.D., Chicago.

Acute Periostitis of the Femur, Wm. Barnes, M.D., Decatur.

Report of a Case in Gynæcology, Naomi Pierce Collins, M.D., Decatur.

Dermoid Cysts of the Ovary, with Report of Cases, Louis A. Malone, M.D., Jacksonville.

A proposition to amend certain parts of the Constitution and By-Laws will be submitted at this meeting. You are earnestly requested to be present.

J. H. Miller, M.D., Secy, 113 Adams St., Chicago.
G. W. Fringer, M.D., Pres., Pana, Ill.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from September 25, 1891, to October 2, 1891.

Capt. Walter Reed, Asst. Surgeon U. S. A., relieved from duty as attending surgeon and examiner of recruits at Baltimore, Md., and ordered to Ft. Snelling, Minn., upon completion of his duties as member Army Medical Board.

Asst. Surgeon Charles B. Ewing, U. S. A., will continue on duty as attending surgeon and examiner of recruits at St. Louis, Mo.

Asst. Surgeon William D. Crosby, U. S. A., relieved from duty at Ft. Pembina, N. D., and ordered to Ft. Missoula, Mont., for duty.

Surgeon James P. Kimball, U. S. A., relieved from duty at Ft. Supply, I. Ter., and ordered to Ft. Clark, Tex.

Surgeon Julius Patzki, U. S. A., relieved from duty at Ft. Huachuca, A. T., on expiration of present sick leave, and ordered to Ft. Supply, I. Ter.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending October 1, 1891.

Medical Director Thos. J. Turner, placed on the Retired List September 21, 1891.

Surgeon Jno. H. Hall, placed on the Retired List September 25, 1891.

Surgeon Jno. C. Boyd, ordered to duty on Naval Medical Examining Board.

The Journal of the American Medical Association

VOL. XVII.

CHICAGO, OCTOBER 17, 1891.

No. 16.

ORIGINAL ARTICLES.

AMERICAN MEDICAL ASSOCIATION.

SECTION OF ORAL AND DENTAL SURGERY.

The Section was called to order on Tuesday, October 5th, 1891, by Dr. E. S. Talbot, of Chicago, Chairman of the Section of Dental and Oral Surgery of the American Medical Association.

Dr. Talbot: The first thing necessary to be done will be to elect a Secretary. Dr. Morgan is unable to be with us at this Section, and so we have to appoint a Secretary. I propose Dr. Custer.

Dr. Custer: I would rather you would have someone else.

Dr. Talbot: There are no minutes to be read; the duties will not be arduous. Those in favor of Dr. Custer being appointed as Secretary signify aye.

This motion was seconded and passed unanimously.

Dr. Talbot: It may seem to some of those present that the numbers are rather small; but having attended all the meetings since the Section was organized ten years ago, with the exception of one, I can say that it never was decided that there should be a large number attending these meetings. It was intended that those that were invited to read papers should be of unusual scientific qualities; and that the papers should have their effect upon the medical profession by being published. For this reason the Society has never catered to a large gathering, but there are quite a number of dentists in the city, and to-morrow we may expect to have a large gathering. There are no minutes to be read; the Section simply keeps a record of the papers that are read at the meeting in a book, and the minutes are not intended to be reported at all. We will therefore dispense with that matter, and the first order this afternoon will be the Chairman's address. I will call Dr. J. L. Williams, of Boston, to the Chair *pro tem*.

Talbot then read

THE PRESIDENT'S ADDRESS.

Gentlemen:—Dentistry from the earliest period up to the present time has been practiced by medically educated men.

Hippocrates, 460 B. C., speaks of dentrifices and the fixing of the teeth; Celsus, at the end of the first century; Ætius, in the sixth; Egenolff and Ambrose Paré, in the fourteenth. All mention certain forms of treatment of the teeth. John Hunter, 1728, spent much of his time in the study and treatment of the teeth, as well as the study of general anatomy; Fouchard, 1747; Bourdet, 1786; Fox, 1814; Catalan, 1826, all practiced dentistry and also wrote extensively on dental subjects.

The instruments for dental as well as surgical purposes which are to be seen in the museums of Europe, together with the beautiful specimens of Etruscan and Phœnician dentistry now in the possession of Drs. Van Marter of Rome, Barrett of Buffalo, and Taft of Cincinnati, and which are similar to those made to day, are striking illustrations of the superior ability which men of early times acquired.

About 1826-1830, the practice of dentistry was not wholly in the hands of an enviable class of individuals. Many were watchmakers, barbers and tinkers of various descriptions, who had taken up the practice for the money that was in it, and were roaming about the country extracting teeth and inserting artificial ones, regardless of honor and ability.

There were, however, a few medical men practicing dentistry, who had obtained a high standing in their chosen profession, and who were anxious to hold their special calling upon an equal footing with other branches of the healing art. Among those, whose names stand out conspicuously in the history of the country, are Parmley, Brown, Hayden, Tucker, Hudson, Greenwood, Maynard, Trenon, Harwood, and Chapin A. Harris and Keep.

We can easily imagine the feeling of these men, who by reason of superior skill and ability had attained high positions in their chosen specialties, when they met in council together to discuss the different subjects relating to the standing of the calling with other specialties, and the qualifications for admission to their Society. It

was not until 1839 that any movement was made on the part of these men to elevate their specialty from the slum in which a majority of the so-called practitioners were holding it. It was at this period that one of the most important events in the history of dentistry occurred.

The *American Journal of Dental Science* made its first appearance, with Dr. Chapin A. Harris and Eleazer Parmley as its editors. The American Society of Dental Surgery was organized in 1840, also through his efforts in coöperation. In connection with these movements, it was the ambition of Dr. Harris to organize a dental school in connection with the Medical Department of the University of Maryland. The practice of dentistry (at this time), with few exceptions, being at a very low ebb, did not impress the faculty of the University as being of sufficient importance to be considered a part of the healing art. The request of Dr. Harris was therefore rejected. Whether this request, at this period in the history of dentistry, would have been rejected by the faculty of any other medical college in this country, or whether it would have been rejected if presented to the Medical Department by any other person, or at any other time, we have no means of knowing. Nor do we know much of the general feeling among physicians at that time, in regard to the relation of dentistry to medicine. We only know that the rejection of the proposition gave Dr. Harris new energy, and as a result the Baltimore College of Dental Surgery was established, and that the School of Medicine and the School of Dentistry ignored each other for a time.

Whether the establishment of a strictly dental school, together with the conferring of a separate degree from that of the medical school, has benefited dentistry, it is difficult to say.

The original idea of Dr. Harris, if it could have been successfully carried out, would no doubt have placed dentistry as a calling upon a higher plane than it occupies at the present time. His idea was that by this union the Dental Department, being a legitimate specialty of medicine, would thus draw support from the medical profession at large. Be that as it may, dentistry, forced upon its career with a new degree, had, with very little aid from the medical profession, to work its own way as best it could. This incident marked one of the greatest epochs in the history of our calling.

Like the young man, sent away from the parental roof, dentistry has grown strong in some of its features. The Baltimore College, owing to the talent of unexceptionally able men, flourished, and men of ability were graduated, who practiced dentistry in different parts of the country, with the new degree of "Doctor of Dental Surgery." So successful was this college, that other schools of dentistry were organized shortly

afterward, and these in their turn became as successful as the mother school.

From the first, graduates of dentistry who were ambitious to excel have never been satisfied with a dental degree only, and many men, anxious to acquire higher attainments, have taken the medical degree also. Many of the graduates are anxious to acquire a broader and more liberal education, but time and purse do not permit it.

Dental students have been ambitious to obtain the highest acquirements, and, in many cases, have not been satisfied with the course of instruction in our dental colleges. The dental faculties have been obliged to so shape their course and so far as possible have made arrangements with medical colleges, that by taking one additional course, their students could receive the medical as well as the dental degree. And there has been a desire on the part of both medical and dental graduates to draw the medical and dental schools together, as evidenced by the fact that medical men are anxious to secure positions in the dental colleges. This desire may not have been outwardly intentional on the part of some, but the relations of one to the other are so close that scarcely any distinction really exists. I have frequently heard medical men, those who have had experience as teachers in both colleges, say that they prefer to lecture to dental students.

The first dental college to unite with a medical college was the St. Louis College. The St. Louis Dental College was founded in September, 1866 and the first announcement stated that the students will have the benefit of the lectures in anatomy, chemistry, physiology and materia medica that are given to the matriculants of the St. Louis Medical College, the first college to take the step in this direction.

Following this, in 1867, the Harvard Dental School was organized in connection with Harvard University; since that date most of the universities in this country have established dental departments. The older dental colleges are uniting themselves as rapidly as possible to universities, so that at the present time nearly one half of the dental colleges are departments in the different universities. Ever since the formation of the Massachusetts Medical Society, in 1781, it has had members practicing dentistry; and the Suffolk District Medical Society, which is a part of the Massachusetts State Medical Society created a section in 1866 called No. 5, for "Surgery and Dentistry;" this is now a quarter of a century old. In Massachusetts, forty or fifty years ago, no reputable dentist would take a pupil, unless he would engage to take a full medical course, or had already graduated in medicine. Scarcely a dentist who has been in practice for twenty-five years, and who has sons growing up is not anxious to have them to take a full course in medicine before taking up the subject of den-

stry, which they regard as a specialty in medicine.

This brief history has been given to show that our best educated early practitioners in dental surgery have always regarded it as a specialty in medicine rather than an independent profession. Dr. Harris so regarded it, and he was the founder of our first dental college, and established this college for the reason that he was not permitted to organize a dental department in a medical college, as he preferred to do. This is evidenced in his inaugural address at that time.

"Allow me," he said, "to observe, however much of interest or curiosity the establishment of this institution may have awakened, it constitutes an era in the history of a most useful and valuable department of medicine."

In speaking of the empiricism that had up to that time existed in the practice of dentistry, he says: "I feel bound to the public and to my own reputation, to denounce the empiricisms that have, and do still exist in the department of medicine." Again he says: "It is to be hoped that the day is not far remote when it will be required of those to whom this department of surgery is intrusted, that they shall be educated men."

Although dentistry apparently seceded from its mother profession in 1840, it was so near to it that, with few exceptions, there has been a yearning on the part of the dental graduates to return to the parental roof. Many graduates of dentistry have availed themselves of the opportunity, and the numbers are increasing every year.

With the convening of this meeting, the Section of Dental and Oral Surgery in the American Medical Association enters upon the tenth year of its existence. At the session of the American Medical Association held in Richmond, Va., in 1881, Drs. W. W. Allport, J. W. Brophy, E. S. Root, Chicago; Dr. J. L. Williams, Boston; Dr. G. L. Goodwillie, New York; Dr. Hauxton, Grand Rapids, Mich.; and Dr. G. L. Hulee, Hartford, Conn., practitioners of dentistry, holding medical degrees, presented themselves as delegates from local medical societies, for the purpose of organizing a Section on Dental and Oral Surgery. Each gentleman constituted himself a committee of one to champion the movement among the members of the Association who were in attendance. They found no opposition whatever; on the contrary, the oldest members, and especially the ex-Presidents of the Association, were heartily in sympathy with the movement, and were anxious to assist in bringing it about. At the morning session Thursday, May 5, Dr. Samuel D. Gross, of Philadelphia, moved for a suspension of the regular order of business, which motion was granted. He then moved that the By-laws of the Association be so

amended as to create another Section, to be known as No. 7, entitled Dentistry. The motion was favored by Dr. Sayre, of New York, and Dr. N. S. Davis, of Chicago, and was adopted. The object of suspending the rules at this time, was for the purpose of creating the Section, so that we might organize and commence work at that session; the members who were to constitute the Section being prepared with papers for that purpose. Dr. Toner, of Washington, objected, saying that he was not opposed to the Section organizing and commencing work this year, but he did not wish to make a precedent for future Sections. It was therefore decided that it could not go into operation until the next year, when, according to the Constitution and By-laws of the Association, dentistry was officially recognized by the American Medical Association.

The effect that this movement produced upon the so-called dental profession was, in one respect, magical. Before this period, scarcely a meeting of dentists convened, without having upon its programme a paper upon the subject of "Is Dentistry a Specialty in Medicine?" Strange as it may seem, many took the ground that it was not, ignoring the fact that it had been practiced as such until, and by some within, the last forty years; that many of its branches were taught by medically educated men, and also that we were practicing upon a part of the human body. Since this period, scarcely a paper has been written upon this subject. The action taken by the American Medical Association, as well as cases which have been lately decided by the courts, have legally settled the question forever.

Fortunately, there is little opportunity for wire-pulling or scheming for political preferment in our Section, for it is well known that the majority of our members prefer that the offices be given to others than to themselves. Thus the time devoted to the Section has been entirely given up to the reading and discussion of papers, and in no dental society in this country, has there been presented such an array of scientific papers as has been given in this Section. The men who have taken part in the meetings of this Section have in most cases been of exceptional ability, and whose standing in the specialty has added dignity to its meetings. The influence of the work in this Section upon the medical profession has brought about a marked change in the Association.

The Section of Dental and Oral Surgery is recognized as a part of the whole, like other Sections, and its members exert as much power in promoting the welfare of the body, as do the members of other Sections. Indeed, the members of this Section have had the pleasure of listening to papers and discussions at its sessions, by some of the ablest men of the Association, which not only added interest to its meetings, but also showed that the members of the Associ-

ation are in full accord with the specialty as a part of the general body.

Since the organization of the Section, editors of medical journals have become quite liberal, as well as more intelligent, in their discussion of dental subjects, and have taken more interest generally in the affairs of dentists; and physicians have accepted invitations to read papers before local dental societies, and dentists have read papers before medical societies. This shows the interest which an interchange of thought is developing, by the union of the different branches of the healing art. Since the formation of this Section, through the efforts of W. W. Allport, teaching in regard to dental diseases has been established in many of the medical colleges of Chicago, which example has been followed in other colleges in the country. One of the arguments used by some dentists against the theory that dentistry is a specialty in medicine, was that the medically educated person knew nothing of dentistry, or those diseases of the oral cavity which result from diseased teeth. Medical men could hardly be expected to know much in regard to the lesions of the mouth, they having received no special instruction upon this subject. The action taken by Dr. Harris and the medical faculty in 1840, no doubt impressed the faculties of other medical colleges with the idea, that lesions of the mouth resulting from diseased teeth were of little consequence, and therefore knowledge of them of little value, to the general practitioner.

Now however, medical men, as well as dentists, know that many lesions of the body are the direct outcome of diseased teeth. In my capacity as a dental teacher in a medical college, I have instructed the students for the past eight years that (in my opinion) many of the diseases of the body, such as pneumonia, consumption, typhus and typhoid fever, eruptive fever, suppuration of the throat and tonsils, aphthæ, ulcers, etc., were the outcome of a collection of micro-organisms in the mouth, and decay of the teeth. My reasons for this theory were that, in many instances in my practice, I have observed patients entirely recover from supposed consumption and other bodily ailments, after the mouth has been put in a healthy condition. In one case a lady gained 35 lbs. in weight, a young man gained 13 lbs., and a young girl who had been treated for six months for consumption, and was supposed to be on her death-bed, entirely recovered after having a number of roots of teeth removed and tonics administered. This theory has been confirmed by Professor Miller, of Berlin, who has observed the bacillus tuberculosis and the bacilli of other diseases in the mouth. In his work upon "Microorganisms of the Human Mouth," he shows how many diseases of the body are produced by pathogenic bacteria by inspiration,

absorption, and being taken into the alimentary canal, which have accumulated in the mouth. To-day many of the medical colleges of the country have a chair upon dental and oral surgery, and the students are now taught dental anatomy, physiology and pathology. Of the six medical colleges in Chicago, there is not one that does not provide for instruction in these branches by some dentist. No medical student should be allowed to graduate without some knowledge of the laws of diseases, and their effects on the mouth and teeth, and no medical college to-day can be considered complete without a chair upon this subject. In view of the fact that able practitioners of dentistry were debarred from becoming members of the American Medical Association, on the ground that they did not belong to some local medical society, at a meeting held in Chicago, in June 1887, Dr. Allport conceived the idea of having a resolution passed, which should admit as members men of ability who held the D.D.S. degree.

With the assistance of Dr. N. S. Davis, the following resolution was presented and unanimously adopted by the American Medical Association, 1887:

Resolved, That the regular graduates of such dental and oral schools and colleges as require of their students a standard of preliminary or general education, and term of professional study, equal to the best class of the medical colleges of this country, and embrace in their curriculum all the fundamental branches of medicine, differing by substituting practical and clinical instruction in dental and oral medicine and surgery, be recognized as members of the regular profession of medicine, and eligible to membership in this Association, on the same conditions and subject to the same regulations as other members.

In the following year, 1888, the Chicago Dental Club, having adopted the Code of Ethics of the American Medical Association, sent the following members to the Association, as qualified under the resolution: W. W. Allport, A. E. Balwin, John Marshall and E. S. Talbot; and since that year, 1888, the Dental Club has continued to send members to the Association. The adoption of this resolution by the representative Society of the country, would seem to show that the medical profession had done its full part to recognize *properly educated* dentists as legitimate specialists in the practice of medicine. The question of relationship has now been definitely settled forever, and the only question now remaining is this: What proportion of dentists, in the future, will so qualify themselves to practice dental and oral surgery, that they will have the right to be classed as medical specialists, the same as surgeons and ophthalmologists, and entitled to recognition in the Association, in accordance with the letter and spirit of the resolution referred to?

Professor Garretson, in a letter to me, stating that in the Philadelphia Dental College, which is in connection with the Medico Chirurgical College, the following distinction is made between

the course conferring the D.D.S. degree and the one conferring the M.D. degree, or both: On matriculation, the student signifies his intention to take the M.D., or a dental degree, or both. If he chooses the course conferring the dental degree, he is taught only such branches as pertain to the treatment and filling of teeth. On the other hand, if he signifies his intention to take the M.D. degree, or both, he receives instruction in the branches that will fit him to practice oral surgery, or oristry, and medicine, as well as dental surgery. The professional position that the educated dentist occupies at the present time, could not be improved upon, as is true of the position he holds in society. His relations with the mother profession are as free and broad as the air of this great American Continent. It now remains for him to decide whether he will be satisfied with little education—with an education that permits him to see only faintly, and to realize not at all, the possibilities of his profession, and renders him content to grope along in the lower stratum of his practice, seeing and wishing nothing higher, possessing only narrow views in regard to his calling, attending no societies, or only those whose time is given to discussions on such subjects as red rubber, amalgam and root filling, extraction of teeth and insertion of artificial dentures. If he is content with these things, and looks upon the profession of dentistry as a trade, merely as a means of subsistence, with as little expenditure of power and thought from himself as possible; will he rest satisfied with this position, or will he take a broader view of the situation, looking at dentistry from all sides, thinking the subject worthy of all his power, all his talents and ability, striving to make it equal to the mother profession, and educating himself so that he may stand upon an equal footing, shoulder to shoulder with the best medical men in the country?

Some one may say that he has not the time nor the money for this. In answer to this, permit me to refer to a Professor in the University of Berlin, to show that it is possible for a poor American boy to *educate* himself for the practice of dentistry.

His worth was recognized by the faculty of the University of Berlin, and a position was offered him as Professor in the University, an honor that has been accorded to no other American. And during my late visit to Berlin, it gave me great pleasure to observe the respect shown by the faculty of the University, Government officials, as well as the highest officer in the International Medical Congress, to Professor W. D. Miller. This example is only given to show that to him who works in the right direction, all things are possible, and the higher he places the limits of his attainments, the greater will his attainment be.

Let the dentist be a scientist, and not a medi-

ocre and narrow-minded tradesman. Let him select a new mark every day, at which to aim his energies and talents, and let that mark be ever ahead, and ever on a higher plane.

Dr. Williams: Unless the writer invites discussion, we will simply pass the paper as it is.

Dr. Talbot: The next paper upon this programme is by Dr. Wm. Carr. In order to facilitate the reading of papers it has been decided to set apart to-morrow afternoon, from three to half past five, for the purpose of hearing papers by Dr. George S. Allen of New York, and Dr. R. R. Andrews of Cambridge; and we have a paper by Dr. A. H. Thompson, of Topeka, Kansas. Dr. Thompson was unable to be present.

Dr. Marshall: Mr. Chairman, I would move that a committee of three be appointed to whom the papers shall be referred before being read.

Dr. Williams: It is customary, I think, to appoint a committee of three.

Dr. Talbot: The motion has been made that a committee of three be appointed, which is always customary in the Sections, to whom the papers shall be referred before reading. I will appoint Drs. Williams, Marshall and Andrews.

Dr. Marshall: It happens, Mr. Chairman, that each one of that committee has a paper of his own to read.

Dr. Talbot: I will refer those papers, then, to members of other committees. I would suggest to those who have papers that they submit them to the committee for approval. That is a matter of form. What shall we do with Dr. Thompson's paper; shall it be read this afternoon?

Dr. Marshall: I have been looking it over. It is interesting from the standpoint of a comparative dental anatomist. It is on that subject. It will take too long now to submit this paper to the approval of the committee, and I have not quite finished reading it.

Dr. Noble: I would like to remark that Dr. Edward Maynard died last evening, and I feel it would be highly proper for you to take, at this very first meeting, some steps in reference to his death, and that proper resolutions should be drafted and that a delegation be appointed.

Dr. Andrews: I did not know he was so near death. I think the suggestion a good one.

Dr. Noble: I presume the announcement of his death will probably be in the evening papers. At the last meeting of the Section in Washington I know there were quite a number who took a great deal of pleasure in visiting Dr. Maynard, and I think he came to one of the meetings. He certainly was a man deserving of respect and appreciation. I should hope that some action shall be taken.

Dr. Williams: I move that a committee of three be appointed to draft suitable resolutions on the death of Dr. Maynard.

Motion seconded and passed unanimously.

Dr. Allen: I would like to include W. H. Atkinson with Dr. Maynard.

Motion seconded and passed.

Dr. Noble: I wish to say that our old friend Dr. Maynard came to this city about thirty-five years ago. I came here as a young man and as a student, and I well remember at that time with what veneration we looked up to Dr. Maynard, who was then in the very height and pride of his national reputation. I wish to bear personal testimony to his wonderful skill with his fingers; his manipulative ability, not only in the matter of filling teeth, but his knack in the way of using tools and instruments in the laboratory. One of the most wonderful men I ever knew with reference to executing what his brain thought out; and we all know what a large brained man he was; and that for many years he was looked upon as one of the leaders in our profession in all things that pertain to advancement in the way of mechanical appliances. He was one of the first to thoroughly remove the nerve, and probably with more thoroughness than was done before or for some years afterwards. This was mainly due to the care which he took in preparing the fine nerve broaches which we are now familiar with. I also feel proud of having his name on my diploma along with that of Drs. Harris and Bond. I think there is only one man living that was on my diploma, and that is Professor Sterner. I feel deep sorrow to hear of the death of Dr. Maynard. Of latter years you have not heard very much of him, and I am sorry to see there has been some language used with reference to Dr. Maynard that seems to me uncalled for; that he has not taken an active part in societies, his age preventing. I hope we will always be ready to say, peace to the ashes of Dr. Maynard; for he certainly was deserving of veneration. As an operator he stood at the very top of our profession. He was always dignified, and as we all know bound up with our profession.

Dr. Talbot: Those in favor of the resolution offered by Dr. Williams, please manifest by saying aye. Seconded and passed unanimously.

Dr. Talbot: I will appoint on that committee Dr. Noble, Dr. Allen and Dr. Williams.

Dr. Marshall: Mr. Chairman, I have been over the paper of Dr. Thompson's and think I can get through it.

Dr. Talbot: The next paper then in order will be that written by Dr. A. H. Thompson of Topeka, Kas., on "The Teeth of Invertebrate Animals." It will be read by Dr. Marshall.

Dr. Marshall: This claims to be a type-written copy of the paper, but whoever did it did not know very much about typewriting. It is not well printed and it is on extremely thin paper, and I can only see it by holding it in a rather awkward way; so that if I stumble it will be because of poor printing.

(Dr. Marshall then read the paper.)

THE TEETH OF INVERTEBRATE ANIMALS.

BY ALTON H. THOMPSON, D.D.S.,
OF TOPEKA, KAN.

The resources of Nature are infinite. The expedients to which she resorts are marvelous and endless in their variety. When new conditions are to be met, her invention is never at a loss, and her capacity for change is boundless. Environments change and corresponding alterations in organs arise to meet the new conditions presented. The life of a species depends upon this power to change, to conform to new environments. The law is adaptation or extinction.

In no set of organs—in animal life at least—is this infinite variety of resources, or the capacity for change, or the power of invention, so fully illustrated, as in the teeth. Food selection has created a wonderful variety of forms of teeth which have arisen in response to changes in the food environment. Those species which could conform to gradual change, survived and transmitted the acquired modifications in the dental apparatus. Those which could not change, perished; or escaped to a more favorable food environment. From such causes many variations in the teeth of animals arose in the course of the geological ages, and, taking the living and the extinct species altogether, the number and extent of these variations is beyond estimation. The variety presented in the different forms of teeth and masticating apparatus throughout the animal kingdom, illustrates and exemplifies the fact that these organs are susceptible of great variation, and that the possibilities of change and the invention of Nature, are especially marked in these organs.

If vertebrate animals present great variations, and many extraordinary forms and interesting extremes in the structure of the dental armature, so also do the invertebrate animals, although these are not so well known. To the naturalist and the philosopher the latter are equally interesting, however, and serve to enlarge our views of the wonders and beauties of nature. To the dental student the teeth of invertebrates are interesting from the comparative standpoint, and serve to illustrate the remarkable possibilities of dental variation, and help to better understanding of the principles of the mechanical evolution of the teeth of animals. In such studies, any knowledge is valuable which may contribute, even remotely, to a better understanding of the important organs which we are called upon to preserve, and thus better prepare us for our chosen work. The study of comparative anatomy is of great value for the side lights it throws upon the teeth of man—their origin, evolution, mechanical design, etc.,—and therefore we claim that the

study of a branch, even as far removed from man as the invertebrates, is of sufficient value to warrant us in presenting a brief epitome of our knowledge of this branch; by way of stirring up an interest in it as an incentive to further study and investigation.

Professor Huxley says, "Anatomy of Vertebrates:" "When invertebrated animals are provided with teeth or masticating organs, the latter are either hard productions of the alimentary mucous membrane, or are modified limbs, as opposed to vertebrated animals, which also usually possess hard productions of the alimentary mucous membrane in the form of teeth; but their jaws are ordinarily parts of the walls of the parietes of the head, and have nothing to do with the limbs." The vertebrate jaw is part of the endoskeleton—the invertebrate jaw belongs to the exoskeleton, as do the teeth of all classes of animals, as illustrated by their embryology.

Mr. W. H. Dall says, "American System of Dentistry:" "Almost every large group of organisms below the vertebrates, until we reach the Moluscoidæ and lower radiated animals, exhibits in some of its members, one form or another of prehensile or masticatory apparatus connected with the alimentary canal. None of these exhibit true homologies with vertebrate teeth, though some of them present remarkable similarity to the latter in external relation. . . . They are divided into manibular and dental appendages in the sense in which the latter may be said to exist in the invertebrates. . . . Throughout the invertebrates the teeth are dermal structures, however much modified, and may consist of calcified connective tissue, of horny matter, or of chitin or an allied substance. . . . The teeth and jaws of mollusks, the nippers, mandibles and setæ of worms, are composed to a greater or less extent of chitinous material."

Prof. A. S. Packard says, "Standard Natural History:" "Hard bodies serving as teeth occur for the first time in the animal series, in the sea-chinns, where a definite series of calcareous dental processes or teeth, with solid supports and a complicated muscular apparatus, serves for the comminution of food. . . . Among the worms the organs of mastication for the first time appear in the Botatoria, where the food, such as infusoria, etc., is crushed, and is partly comminuted by the well marked horny and chitinous plates attached to the mastax. In most other worms the mouth is unarmed. In the leech there are three, usually in the annelids, two denticulated or serrate, chitinous flattened bodies situated in the extensible pharynx of these worms, and suited for seizing and cutting or crushing their prey.

In the higher molluscs, such as the snails and bivalves, besides one or more broad pharyngeal plates, comparable with those in the worms—is

the lingual ribbon, admirably adapted for sawing or slicing sea-weeds, or cutting or boring into hard shells, acting somewhat like a lapidary's wheel; this organ, however, is limited in its action, and in the cuttles, the jaws, which are like a parrot's beak, do the work of tearing and biting the animals serving for food.

"In the crustaceans and insects we have an approach to true jaws, but here they work laterally, not vertically, as in the vertebrates; the mandibles of the articulate are modified feet, and the teeth on their edges are simply irregularities or sharp processes, adapting the mandibles for tearing and comminuting food. The numerous teeth lining the crop of crustaceans and insects, serve to further comminute the food, keeping the larger particles back till finely crushed."

Professor Bradley says, "Manual of Comparative Anat.:" "The lowest forms possess no teeth, except some ciliate infusoria, which have an internal cylinder of parallel rods for the mastication of food. . . . In the Rotifera the denticles are in the shape of denticulated plates. The Echinodermata have five large teeth placed in the formidable apparatus called 'Aristotle's Lantern.' In the Annulosa the leech is the only member that possesses teeth, the semi-lunar plates imbedded in the muscular walls of the mouth; but the remaining classes have only mandibles and maxillæ which are very hard and chitinous. Among the Molusca, the Gasteropods possess a strap-like organ, the odontophore, which is studded with teeth. Cephalopods possess horny jaws which move vertically. Some other classes have denticles besides."

"In the Annelids (Dall, op. cit.) so-called teeth occur in many groups, but partake rather of the nature of jaws than teeth. This group comprises most of the worms, as well as the leeches. Their bodies are divided into more or less well defined, regular segments, and in general the jaws are on the second or buccal segment, or on a proboscis which is itself on the outer edge of this segment, and may be protruded from the mouth to a considerable distance. They are chitinous, most commonly paired, lateral and opposite, of almost infinite variety of forms, resembling in a general way the maxillæ of insects, and mimicing in miniature, hooks, combs, saws, rasps, claws, etc.

"In the leeches the mouth is provided with three lenticular jaws, with the projecting edges finely serrated, having a partly rotary motion about a point central to the three. The medicinal leech has two rows of serrations on each jaw.

"Among the crustaceans—lobsters, shrimps, crabs, etc.,—the maxillary organs are but modifications of entire limbs translated from the locomotive series and set apart as special mouth organs. . . . In the higher crustaceans the

anterior part of the stomach is provided with certain masticatory appendages or stomacholiths, often termed teeth, though more analogous to a sort of a calcareous gizzard. These consist of several calcareous pieces, moved by appropriate muscles inserted in the membranous wall of the stomach, armed with a smooth medium plate and lateral molar-like organs, whose mimetic resemblance to the molar teeth of some forms of mammalia affords a beautiful illustration of the way, through the selective influence of similar functions, analogous structures may be built up in organs which have no homology whatever. Two smaller points, bicuspid in the lobster, tricuspid in the crab, complete the calcareous apparatus.

"Among the schinoderms, the sea-urchin has a remarkable apparatus called "Aristotle's Lantern," which contains what may be fairly regarded as true teeth. . . . It is very complicated in its arrangement, but in essentials consists of five hard, calcareous wedge-shaped sockets or alveoli, each containing one porcelainous chisel-shaped tooth. The teeth are, like those of rodents, usually worn more on the inner than on the outer side, and therefore in wearing always preserve a sharp edge. The combination of the teeth and alveoli produces a pentagonal cone, the apex being formed by the coming together of the points of the teeth. In life this cone is concealed within the tissues, only the points of the teeth projecting."

Not many of the Mollusca are provided with teeth; the entire group of Acephala (the headless molluscs, such as clams, oysters, mussels, etc., are entirely without head or dental apparatus. And not every one of the Cephalopoda (whelks, snails, periwinkles, etc.,) are provided with teeth, but most of them have such organs. When they are found they are arranged on the "odontophore," a chitinous band upon which the teeth are set, pointing upward and backward like the papilla on a cat's tongue, and it grows out of the radular sac in the floor of the gullet. The floor of the sac is carried forward, with the radula upon it over an arched, cartilaginous mass called the buccal cartilage, and down to the front edge, immediately behind the mouth. This serves as an elastic pad which may press the denticulated surface of the radula against any object to be torn or cut. This is controlled by muscles which draw it backward and forward, or even protrude it, as can be seen in the common wood snail, in which the pink buccal mass is pushed forward to seize and cut food. In the snail the number of these teeth is remarkable, 12,000, to 40,000 have been counted on the saw-like lingual ribbon. It can cut grass or leaves sharply off. As the teeth are worn off the ribbon, it is uncoiled, and new teeth are thus brought into use. The upper part of the mouth is lined with a horny substance, against which the sharp-toothed tongue works with a

rasp-like motion. The tough leaves of the lily may often be found cut by the snail's lingual ribbon.

"The teeth on the strap-like odontophore are varied and remarkable in shape and size, and are difficult to examine, as some of them are very minute and hard to dissect out and study. They are usually composed of a base, a shank or stem, and a cutting edge, the latter simple or variously denticulated. The form of the cutting edge is varied, the carnivorous forms usually having simpler and more claw-shaped teeth. When arranged in rows, as they are in many forms,—the middle row is called the median or *rachidian* teeth, and the lateral rows, the lateral or *pleural* teeth. The latter are usually right and left.

Sometimes there are teeth outside of the lateral rows which are called the *Uncini*, and are flat, plate-like, or slender, spiny teeth. They may be very numerous, as in the vegetable feeding snails, or wholly absent in other forms."

There is much to be observed about the teeth of the snails and their allies, and the field offers a profitable opening for investigation. They are already divided into classes by an elaborate system of arrangement, but much remains to be done in describing varieties. "The adult perfect teeth vary from nearly transparent to an amber yellow or reddish brown, and sometimes the cutting points are black. In any large whelk they are easily seen, and in a large cuttle fish the radula may be an inch wide. On the other hand, in some small land snails, where the whole shell is not larger than a pin-head, high powers are necessary to observe them. . . . The highest type in the system of classification is called the *Toxoglossal*, or arrow-toothed, from their narrow, round form, often barbed, and sometimes hollow to inject poison—as in *Belaor Conus*.

Next come *Rachiglossa*, having only rachidian teeth, as in the common whelk. The teeth are usually slight and varied, and prettily denticulated on the cutting edge. The next is the *Tenioglossa*, bent-toothed, including the greater part of the fresh water snails. The *Ptenoglossa*, feather-toothed, are a small group, of which the sea-laria is a member. The *Rhiphidoglossa*, needle-toothed, comprise a large number of sea-snails, and a few operculated land snails. The last is *Docoglossa*, chevron-toothed, and includes the limpets. Some snails present a pavement-like form and arrangement of teeth, which are often of a very pretty pattern, or again a mere hardened mass.

We have thus given briefly the outlines of a study of the teeth of invertebrates, merely to indicate the extent of the subject, and to suggest the interest and attractiveness there is in its pursuit to the naturalist; and in addition to this, to suggest that the study of invertebrate odontology has a positive value to the comparative dental

anatomist, from a philosophical standpoint. As a leaf from the great book of Nature, it unfolds to us many of her beauties and wonders, and it is also pregnant with suggestions to the dental student who follows his subject out into all of its branches. So we find in this branch, varieties of form and adaptation to purposes which are not paralleled in the vertebrates. The study of their forms and fitness to perform particular duties, is full of interest and surprises, in the fertility of design which Nature exhibits. Then the analogies presented are very interesting, as in the case of the cuspidate teeth of the stomacholiths of the crustacea, which resemble vertebrate grinding teeth, and show that similarity of function often develops similarity of form, even in dissimilar parts. Of homologies with vertebrate teeth, there are few, as the jaws of the articulates work horizontally and those of vertebrates vertically. In the few instances of invertebrates which have vertical jaws, those parts are armed with beaks and the teeth are situated further back on the odontophore. The teeth of the sea-urchin have true sockets and alveoli, but their arrangement, support, and motion are very different from those of the vertebrates. So that taken altogether, the class presents few homologies with vertebrates, or even resemblances to them, and thus affords a variety of illustration that the latter does not supply.

Dr. Talbot: You have all heard Dr. Thompson's paper read by Dr. Marshall. Are there any remarks?

Dr. Whitefield: There is very little I could say on the subject. Last summer I was very much interested in the study, and I have some teeth at home which I think are nearly three-eighths of an inch long and the arrangement is very beautiful. There is a little skeleton-like arrangement something like a trap, coming to a point, and the tooth presses down over that point. They all work separately.

Dr. Rusk: A few days ago, I saw a specimen which I would like to show here, and will bring here some time during the session. It is a very large tooth that was sent here by some chief in the west, and the remarkable part of it is that the enamel is black or almost black. It is a very immense tooth with very short roots. I think it is a very rare specimen.

Dr. Talbot: As the sessions are to be very short and we have to leave the room at half-past five, and as there are a large number of papers, it would seem to be a good plan to have another one this afternoon, so as not to crowd them in the last session; and I would suggest that Dr. Marshall read his paper.

Dr. Andrews: I think it would be better to have Dr. Marshall's paper held over until another meeting. It is an interesting paper and there will be more members present.

Dr. Talbot: What is your pleasure in regard to the matter? I would suggest adjournment.

Dr. Marshall: I move that a nominating committee of three be appointed, to nominate officers and report to-morrow afternoon. Seconded and passed unanimously.

Dr. Talbot: I appoint Dr. Marshall, Dr. Taft and Dr. Williams. The motion to adjourn is now in order. Seconded and passed.

WEDNESDAY, MAY 6.

The meeting having come to order, Dr. Talbot occupied the chair.

Dr. Talbot: The first order of business this afternoon will be the election of officers. According to the Constitution and By-laws, officers are to be elected the "second day of each annual meeting." I believe a committee was appointed to attend to the matter, and as this is the time for that order, we shall have to take it up at this hour. Have the nominating committee any report to make?

Dr. Marshall: Mr. President, the committee has not been able to get together yet, but we will make a report after the discussion closes.

Dr. Talbot: If there are no other committees ready to report, the next order of business will be papers from Dr. Geo. S. Allen and Dr. E. Andrews.

(Dr. Allen here read his paper, after which he illustrated the same by stereopticon views.)

THE GENESIS OF THE CONTOUR FILLING.

BY GEO. S. ALLEN, D.D.S.,
OF NEW YORK, N. Y.

So generally accepted is it by the profession at large that the contour filling represents the highest development of the art in conservative dentistry, that it is as much as a man's reputation is worth, to say a good word for the old-fashioned face filling of years gone by. Practice and precept, it is true, do not always follow the same road; still it is a healthy sign of growth to see the highest ideal kept well in the foreground in all our discussions and writings. No subject has been so well and so ably handled by the wise men in our profession, as the one that presses the claims and advantages of contour work. So true is this that he who would start on the hunt for one single brand new thought or idea on the subject, would have a weary road to travel and have little to show for his time and trouble when he came to foot up his returns.

At the best he could only hope to attract attention by giving some more beautiful or apt illustration to some well-worn idea or principle that had already become the common property of all. So I turn aside from this uninviting field of labor to another—one more practical, and I hope therefore more interesting, and will confine my thoughts

entirely within the lines marked out by the title of my paper: The Genesis of the Contour Filling, or how it is made. And this I do for the further reason that so far as I know the cardinal rules to be kept in mind in this kind of work have never been presented to the profession in short compass.

Even within these lines I doubt much whether I can give you much that is new. Still, I think a little less attention has been given to practical instruction in building up the contour filling, than to preaching about its many advantages and beauties. This close attention to one thought will also preclude entering into any discussion as to when and where to attempt the full restoration in the shape of the tooth under treatment. Individual judgment largely controls practice in all cases, and the wise dentist, like the wise physician, always adopts the elective motto. The wisest short law I have ever seen pertaining to this point, came to me in a private letter from an acknowledged authority on the subject, and sums as follows:

"To understand me more completely, I would state that I have not for a considerable time been in favor of inserting very large gold fillings in this manner, and for the reasons you have given in your paper, that the structure and elements of the tooth are not such as to promise a durable retention of the mass of gold, by the weakened tooth. But for medium-sized and small cavities, I am equally convinced from long experience and observation of my own, and the work of others, that no other method offers the same degree of permanency or usefulness."

By so doing he placed himself in the position of the philosopher who said he always obtained what he wished for, and added, sotto voice, "I take good care never to wish for what I cannot obtain."

Taking up then, the building or making of a contour filling, a threefold division of the subject naturally presents itself:

1. The preparing of the cavity. 2. The placing therein of the filling material, and, 3. Finishing and polishing the completed work.

Now a good deal that may be said about the preparing of the cavity will apply to the simpler and easier operations of face and crown fillings; but this one wide difference must be constantly kept in mind, viz: as the size of the cavity increases, the difficulties and dangers increase, not proportionately, but in a geometrical ratio, and therefore a relatively greater care and attention must be given to all the details of the longer and more complex operation. A few quick sharp cuts will suffice for preparing a simple crown cavity, but they would fall far short of filling the bill in any case that we propose to consider this evening.

As the architect or engineer sees his complet-

ed work, before the actual is even started, so should the dentist be able to discern the full size, shape and figure of his proposed restoration, and each step should be so carefully planned and made to fit the next, that in the completed whole, nothing may be wanting.

Very much of success depends on bearing this safe rule in mind. In fact, it is difficult to conceive how one can plan wisely unless he does. On the size and shape of the cavity, on the proper distribution of retaining undercuts or pits, so as to protect and strengthen weak walls and throw the burden on strong ones, much good judgment can be placed, and the writer is convinced that just here may be found the cause of many failures. Undercuts are made too deep, and retaining pits made in such positions or manner as to either weaken the tooth or endanger the pulp. Deep undercuts, though they make operations easier, are seldom called for, and endanger the completed work, and they do this in two ways: 1st. By weakening the walls of the cavity, and 2d. By making real obstacles to forming a homogeneous, well-packed filling.

The deep undercut, though it holds the great bulk of the gold in place, is itself difficult to fill. To do so well, takes much time and care, and the use of exceedingly small pluggers, and this they may not receive. Where all the walls of a cavity are standing, and the face of the tooth adjacent to the cavity is perfect, the walls of the cavity should be left as nearly parallel as possible, and no pits of any kind made. In fact, nearly parallel walls should be the rule, and pits always avoided, when possible.

The real study and judgment is called for in those cases where the natural face or faces of the tooth have been lost, either by decay, or the too free use of the file and chisel, for, as will be referred to a little later on, in speaking of packing the gold, a point of considerable interest and value arises in these cases, as to whether the filling should be allowed to overlap the walls of the cavity, and simply lie against the face of the tooth on the outside, or shall be made continuous with the walls of the cavity, and bulge only from the cavity itself.

Believing fully as I do that overlapping gold is gold in a dangerous position, I would strongly advocate such a preparation of the cavity as will minimize this danger, even if by so doing, the full realization of our ideal in contouring be not carried out.

It is a sort of belief with many, that in all cases, the packing of gold should be commenced at the cervical wall or base of the cavity. This is a mistake. Oftentimes more certain and rapid work can be done by starting the filling back in the grinding surface, and building downwards. And so this point should be considered, and the cavity shaped accordingly.

As the enamel forms the edges of most large cavities, its proper management is a point of interest. Long ago I advocated in a paper read before the New York Odontological Society, the complete removal of the thin edge of the enamel often found at the neck of the tooth, and this I did for the double reason that it was only slightly adherent to the dentine just there, and so liable to split off during the operation of filling, and secondly, it was very difficult to make a smooth edge on it.

Since that date, I have seen no reason to alter my judgment in respect to this method of practice, but have had many confirmatory ones brought to my notice. Leaving the thin edge leaves a weak spot, and that is bad.

A final point to observe in shaping the cavity, consists in making the edges smooth and polished, and just here the great advantage of the dental engine, with its rapidly revolving bur, comes to the front. No hand instrument, no matter how much care is used, can compete with it. A sharp, well-cut bur will do in a few minutes, far more effective and perfect work, than the sharpest hand instrument can, in a far longer time. If, in addition to the bur, the edges are polished with the wood point armed with powder, or still better, with an uncut round soft iron point, armed with diamond dust, perfect edges can be quickly obtained.

We come now to what many will think the most important part of the work, and the one in connection with which probably more science and skill can be employed than in any other. Two great essentials are to be here considered: The perfect adaptation of the gold to all the walls of the cavity, and the accomplishing this with a minimum amount of force, and a third may be added; that the filling may be made homogeneous and solid throughout.

Imperfect adaptation makes failure almost a certainty, and undue force (and by this I mean any amount of force over and above that required to condense the gold), is almost equally fatal in the end. How then, first of all, shall we proceed to make the gold fit the cavity?

The quality in gold that we make use of in building up a filling of this character, viz: its welding property when pure and freshly annealed, is not one that can be trifled with. It is our servant if we handle it rightly, our master, if we fight it in any particular.

In skillful hands, pure gold is almost as pliable and obedient to the touch, as the clay the sculptor uses to fashion the child of his fancy, but there is this difference: the clay can be worked over and over again, a little added here and as much taken off there, and so long as it is kept moist, it responds to the brain back of it; but not so with gold. Place a bit in position in such manner as to ensure perfect contact with that already in place, and the union will be perfect,

and it becomes a part of it; but you cannot try a second time; the first is the only one that will be allowed you; if it does not take its proper position at once, you may be sure that something is wrong, and you cannot make that wrong right by using extra force. The moment that is done, the evil that resides in the metal, and that heretofore had been dormant, manifests itself. It becomes stubborn, brittle and cranky, and will not do anything you want it to do, but will persist in doing everything you most object to; like some individuals it has a dual nature, and we must beware how we call out the perverse side.

Then again the amount of force used must always be proportionate to the size of the pledget to be packed, and exactly, too; not enough force fails to insure solidity, and too much has a tendency to bring out the harsh qualities alluded to. As the pledget must be packed in the exact position in which it is first placed, and cannot be moved from it, great care and good judgment are required to avoid pits, and to make certain that the surface is kept even, for it is much more difficult to fill a pit or sharp depression, than to continue a flat surface; and the permitting of pits near the walls of the cavity is especially to be avoided, for the extra force necessary to fill them, too often weakens the walls or even crumbles the enamel. So the rule to be observed is to, as far as possible, carry a uniform surface upwards, and as the filling grows keep the marginal portions a little in advance of the centre.

Another advantage that results from this plan of procedure, is that it makes more rapid work possible, in that you can use larger points. A pit or depression near the walls necessitates the employment of small points, for the point in use must always be a trifle smaller than the pit to be filled. This suggestion is by no means an unimportant one, and a little thought will soon convince one of that fact. The correct packing of gold is in truth an art of itself, and requires an educated touch, and correct eye.

The celebrated painter, Meissonier, always took the greatest care of his hands, keeping them scrupulously clean, and even tender, by the constant use of gloves. He said that a painter's touch must be most sensitive and delicate. So it should be with the dentist, and he ought to be just as careful and particular. Long finger nails, or callous finger tips are to be avoided.

Where to start a filling is a matter of some moment. It is generally commenced at the cervical wall, but cases frequently occur where the commencement may be made with advantage back on the grinding face of the tooth, and the filling carried backward or forward to the floor of the cavity. An advantage frequently arises from this method, for by carrying the gold along the sides of the cavity towards the bottom, any movement of the gold is avoided, and pits to ac-

comply with this same purpose are not required. Anyone who has not tried this plan will be astonished to find how frequently it facilitates the operation. Deep pits in the writer's opinion are great nuisances, and are only admissible when other means fail to accomplish their purpose.

What has been said regarding the manner of making a filling, leads naturally to a consideration of the points to be used, their shape and the best methods of applying the force necessary for condensation of the gold. If the gold is to be built up layer by layer, in a series of plains, the thought naturally suggests itself, that the shape of the points should conform to that of the plains themselves, in fact, should have flat surfaces, and this will be found to be a correct statement. The late Dr. Varney was the first to incorporate this principle in a series of pluggers especially intended for packing cohesive gold, and the set made from patterns furnished by him, to this day stand unequalled for their especial adaptation for contour work. The points all have plain surfaces, and are very finely and evenly serrated. Slight modifications only have been made in them since his day, so completely did he work out his theory in steel.

A round point may have some limited utility at times, but never can be relied upon to any extent. It would be a matter of the greatest difficulty to make a large, uniformly-packed filling by their use only. Deep serrations are faulty in that they cut the gold and require extra power to force the gold into a solid.

How to apply the requisite pressure is now to be considered, and possibly it is the most important consideration of all—how to apply just enough force for the purpose, and to apply it quickly, uniformly and evenly; how to apply the "quantum sufficit" and no more, and in a manner to give your patient the least discomfort, and lighten the labor of the dentist, is a serious problem.

I take it that few would seriously consider hand-pressure alone as offering the best solution. Let alone its being the most laborious and tedious method, it rarely produces perfect work. We cannot get along without it, especially in commencing operations; but good judgment and good work alike demand that it be supplemented by some means more under control, more direct in its action and developing more power; and this can only be done by resorting to some one or more of the various devices which the ingenuity and thought of the profession has placed in our hands the utilizing the power of momentum, or, in plainer terms, the mallet.

The late Dr. Atkinson, whose memory we hold in respect, and whose loss we deplore, was probably the first to suggest this means of obtaining the desired end, and in his hands, and in the hands of his followers, the hand mallet

was made to do most excellent service; but it was soon found that it offered only a partial solution of the problem; to mallet for oneself, was awkward and oftentimes impracticable, and the impossibility of making two brains work in harmony, made the assistant malleter as often a nuisance, as a help; and careful operators soon gave it up, as being impracticable. The automatic mallet, in some of its various forms, took its place, and so well did it do its work, that it will probably always hold its own, and retain a well-deserved place in the dentist outfit. Then followed the electric mallet, a step in advance and a big one; but it had many inherent defects, that greatly impeded its general adoption.

To-day, the mechanical mallet is slowly but surely coming to the front, and the writer feels certain that the day is not far distant, when it, in some of its modifications, will supercede all others, and for reasons that will now be stated as clearly as possible.

Let it be premised that the more closely the force required can be made to simulate hand-pressure, the better it will be in all ways, safer for the tooth and easier for the patient to bear. Now this is just what the mechanical mallet does, in truth, it is pressure intermittently applied, and in no wise is to be likened to the hammer-like blow that is given either by the hand mallet, the automatic, or the electric.

Take a look at the mechanical mallet in operation, and notice how it works. You will see that the point is placed in contact with the gold and gently pushed forward. This throws the further end of the mandril holding the point back, so that the lug or rounded bit of steel with which the rapidly revolving wheel is armed comes in contact with it and it is pushed forward, and this is repeated with every revolution of the wheel, so that from 1,000 to 3,000 impulses may be given to the point every minute, the direction, number and power of these impulses being perfectly under the control of the operator.

In the mallet I employ, which is the Bonwell mallet, as modified by Dr. S. Perry and Mr. Weber, there are 80 threads to the inch in the adjusting screw, and 40 notches in the collar, so that a movement of the collar one notch brings the plugger mandril $\frac{1}{3200}$ of an inch, or the thickness of the diameter of a human blood corpuscle, nearer to or farther away from the revolving wheel; and yet, small as the distance is, it is distinctly appreciable to the operator and the patient alike. Does it not look reasonable that a forward push movement of the point, through these small distances, must be comparatively safe and can be made to expend itself in the packing of the gold, and the packing only?

A valuable point I have observed is that where the serrations of the point are rightly made, that is, having one side longer than the other. the

point travels over the surface of the filling and has simply to be guided by the operator, so that if placed near the centre of the filling, it will move over the face of the gold in just the direction and manner required. Thus it becomes the easiest thing in the world to pack towards the walls of the cavity. The gold is plastered in position, as it were, easily and rapidly.

The kind and quality of the push can be regulated in several ways other than by the adjustment collar; by increasing or diminishing the speed of the motor, a great change is at once perceptible; and, again, the educated touch will hold the point against the gold so as to ensure perfect packing, and no force wasted. In fact, through a wide variation of power, it is under perfect control.

A few words in closing, on the finishing. This is a matter of detail, and often of sad neglect. Too high a polish cannot be given to the perfected work. Do the best we can, and we will fall short, far short, of Nature's model. Time and labor cannot be thrown away, if intelligently employed in the finish.

I mentioned in speaking of packing gold, that solidity and homogeneity were essential considerations. I grant that a filling that is hard enough to resist pressure, and is perfectly adapted to the walls of the cavity, will prove effective; but perfect adaptation and the requisite hardness, as a rule, also mean homogeneity, not always though; yet I feel certain of my position, when I say that it is not only far easier to finish a uniformly dense filling, but that the work can be done in a shorter time, and always in a more satisfactory manner.

I know of no more discouraging labor than that employed in attempting to put a finished surface on an imperfectly packed filling.

Where a tooth has been mutilated by disease, or the file and disc, a question often arises, as before mentioned, as to whether the gold shall be allowed to overlap the edges of the cavity, or simply be rounded out from them. It is doubtful whether gold can be made to lay against tooth substance in such a manner as to prevent the ingress of fluids. The thinner and deeper, or thinner and wider the overlapping gold, the greater the doubt and uncertainty. If the diameter of the gold is one-third or one-half greater than that of the cavity, we may be almost certain of trouble in the near future.

The difficulty in making a perfect edge is also greatly increased in these cases, and so it is a safe rule to observe to finish the gold to fit the cavity, and to take the place of an overlapping lid as little as possible.

In shaping, the articulation should be left always in such a condition that the filling should, on mastication, be pressed back into the tooth, not out from the cavity.

As a means of education, I know of nothing

superior to making fillings out of the mouth. Anyone who has not tried it will be surprised at the amount of instruction that can be acquired in this way, and in no other. Any earnest worker who makes the experiment will be astonished to find not only that the operation is not easy, under these simple conditions, but as he aims for perfection, how difficult it is to attain. His edges will remain imperfect, and his powders will scratch, and he will wonder how he ever succeeds in the mouth.

To sum up, in preparing your cavity be careful to avoid deep undercuts or pits, and throw as little strain on the enamel as possible, and make clean, polished edges. In packing the gold, bear in mind that your filling must be homogeneous throughout, perfectly fill the cavity and built up in a series of plains, and in finishing imitate Nature in the high polish you put upon your work, for at your best will you fall far short of her beautiful handiwork. To do perfect contour work requires care and skill and a conscientious regard for all details. With practice and experience one will be surprised to find how often the impossible becomes possible, and the difficult easy of attainment.

Dr. Taft: Mr. Chairman, the paper just read is a very good one. It contains points that ought to be regarded and utilized in the treatment or management of the borders of cavities, and especially proximate cavities, which is one of the most important particulars in the matter of filling. It strikes me that in all instances, the operator should be guided by the kind of material or tissue he is working upon, or rather the character of the material. Some teeth are of such good structure, that treatment for the arrest of decay is more easy and simple than in others. The importance of thoroughly studying the character of the tissue upon which the dentist expends most of his operative skill should always be kept in mind; to know just what he is working upon—whether strong, firm teeth, or those of poor, soft structure. It requires very delicate manipulation to secure the best results. I think this is one of the most important points, and a point that is much overlooked by many operators.

Another point that was emphasized, and justly so, was the perfection of finish which ought to be put on the border of every such cavity. It should be polished or dressed with diamond dust, or anything else that will make a perfect finish. Another point is, the overlapping of gold. We all know there is a great deal of faulty work done in this direction; gold overlapping that ought to be cut away. I think that there should be no more overlapping than there has been cutting of the enamel or dentine. In no instance should gold be permitted to overlap the normal or uncut surface of the teeth.

Another point is the uniform condensation of gold in the cavity. Now we may say it is not of great importance, but it is, for if the gold condensed is defective or imperfectly consolidated, there is always room for mischief. It should be a matter of study, then, to secure the most uniform condensation, the most perfect adaptation, the most uniform condensation of the gold throughout the cavity. Great skill is required, and delicate and intelligent manipulations, to secure good results. As to the welding, skilful manipulation is required; the material used must be in good condition, if gold, it must be properly annealed. Any mistake in annealing is fatal. The gold must be free from foreign substance, and it should be pure, and it must be condensed with proper instruments. I believe that nine-tenths of the instruments used are not as they should be. Those only who have manipulated a great deal can tell you how to do it; that is only attained by experience. It is a process that is difficult to definitely explain. The most direct pressure that can be made on the surface is best; if an oblique blow is given, you will very likely destroy the surface for receiving the gold; the best results are attained by as direct pressure as possible. The paper is full of good suggestions.

Dr. Talbot: Any further remarks? Then Dr. Allen closes the discussion.

Dr. Allen: I wish there was a little more discussion on this subject. I always like putting in contour fillings. I think there is as much conscience required as skill; and no man can do good work unless he puts his conscience into it. I am very glad to have my old friend, Dr. Taft, so kindly bring forward many of the points in my paper, and I appreciate it. I will only draw attention now to one point in my paper, to see if I cannot bring out some more discussion about it; because it is a point about which I have thought a great deal, and I hope with good results to myself. It refers to the face of the teeth. The question I want discussed, and I have not seen any writing about it to any extent, is this question of whether gold ought to be built up overlapping the cavity, or rather the gold shall bulge over the cavity, and be finished off. I take the position, and believe that it is one that is substantiated both in practice and in theory, that the building up of the gold overlapping filling, simply lying against the face of the tube, is a great error. Gold in a plastic condition, if overhammered, becomes springy, and does not take position against the face of the tube that you can work with certainty as being a perfect joint. In contour filling, you hammer it against the side of the cavity, there is unequal pressure brought in pressing it in place, and the gold loses its soft character and becomes springy; and the more you hammer it, the more the springy qualities of the gold are brought out, and it will work away from the side

of the tube, and not lie uniformly and flatly against it. That point is one I would like very much to hear some discussion about, as to the advisability of allowing the gold to overlap the edges of the cavity to any extent, and if any, to what extent. I thank you very much for your kindness in hearing my paper, and for the favorable reception of it.

Dr. Talbot: We will now hear Dr. Andrews' paper on the "Growth of the Cementum."

GROWTH OF THE CEMENTUM.

BY R. R. ANDREWS, M.D.,
OF CAMBRIDGE, MASS.

In the year 1858 Magitot, a French histologist, claims to have found within the follicle of a developing tooth a special organ for the development of the cementum. In 1861 Robin and Magitot made a presentation of the same facts anew. With the exception of these authors, I am not aware that any other authority has recognized the presence of this special organ; while such men as Kolliker, Waldyer, Herz and others have formerly denied its existence. In my own investigations I have not been able to trace it with certainty, although there are appearances in a fully formed follicle of a tissue under the calcifying dentine germ between it and the outer covering of the sacculus that might admit of the supposition of the existence of such an organ. I have noticed this appearance in sections from embryos from the pig and the calf. At a later stage, where the crown is further developed, there is also to be seen infoldings of the tissue at the base of the germ, that may develop into an organ for the growth of the cementum, as stated by Magitot. But in teeth more matured, where the cementum has already commenced its growth, I cannot trace even the outline of a special organ, although I do not consider my investigations to have been extensive enough to warrant me in denying its existence altogether.

Wedl, whose description of the development of the dentine and the enamel is so minute, has but little to say about the development of the cementum. He tells us that, at the margin of the crown, the dental sacculus contracts, and upon its inner surface the formation of the cement is affected, increasing gradually as the formation of the root advances. The lower segment of the dental sac becomes, therefore, the root membrane of the tooth. He believes with Tomes that Nasmyth's membrane belongs to the cement. Again, he states that the dentine and cement are connected together by means of a layer composed of an agglomeration of transparent globules of varying degrees of thickness. The spaces intervening between the latter (interglobular spaces) are irregularly notched and frequently in very close proximity to one another.

He considers that the cement commences outside of this layer, but some of my own sections show it as a dividing line. In describing the methods in which hypertrophy of the cement is formed, he speaks of the various sizes of the corpuscles which form it, stating that many of them have a glistening appearance. Smaller corpuscles are sometimes attached to the sides of larger ones, or are blended with them. Large and small ones also occur separately. These so-called corpuscles are, I believe, globules of calco-globulin, forming by merging into others a layer of calco-globulin, that shall form the matrix of the hypertrophied cement.

Tomes tells us that it is difficult to point out any distinguishing structural character between primary bone and that of the cementum. The cells close to the surface of the forming cementum, which were formerly called osteal cells, have now been named osteoblasts. No bone is formed until after the appearance of this osteoblast tissue, and Rollet believes that these osteoblasts are essentially a new growth; they are so distinctly marked off that it almost assumes the character of an epithelium. If we harden a partially-formed tooth in chromic acid, and subsequently decalcify and cut it transversely through the root we meet with the following structures from without inwards. On the outside is the outer part of the sacculus, now the periosteum. Internal to this is a layer to which the name cambium has been given, consisting of roundish cells with processes. These lie in a reticulum made up of cells which give out a small number of homogeneous transparent processes. By the inosculation of these processes a net-work is formed. Between this net-work and the fully-formed cementum lies the osteoblast layer, consisting of much larger cells. As the osteoblasts form a continuous layer and are very numerous it is obvious that only a small percentage of them ever form lacunæ or bone cells, or otherwise retain their individuality. As the process of calcification goes on the outlines of individual cells become lost in the general transparency of the matrix, only a cell here and there remaining as a lacuna. Again, he states that contiguous osteoblasts become fused together by their exteriors, so that their individuality is lost.

Prof. James Tyson, in 1873, writes: Some difference of opinion existed as to the exact tissue which undergoes conversion into cementum, some alleging that it results from ossification of the tooth sac, while others, among whom are Kolliker and Beale, believe it to originate in a soft stellate tissue, made up of branching and communicating cells, which are found upon the surface of roots of teeth, and within the tooth-sac. This tissue undergoes calcification, spherules of one being deposited, which gradually fuse and form a transparent, intercellular substance. In

this process not all the cells of the stellate tissue become lacuna of the cementum, but some are obliterated by the deposit, and there are therefore fewer lacunæ in the resulting cementum than in the previous stellate tissue, while the canaliculi are much more numerous than the prolongation of the stellate cells, many of the lacunæ having thirty or forty prolongations, while the stellate cells rarely have more than from ten to twelve. The cementum is more slowly formed than bone, and a more permanent, but probably less perfect tissue; its matrix is harder and more transparent, in this respect approaching the dentine.

Klein tells us that the tissue of the tooth-sac represents the matrix from which the cement is formed; its structure and function are that of the osteo-genetic layer of the periosteum, and that the formation of the cement out of that tissue is identical with sub-periosteal bone.

My investigations show that if we examine the developing tooth, just after the cementum has commenced to form, we shall find that the matrix of the cementum is made up of masses or layers of that tissue, which we find everywhere on the borderland of calcification, between the organic and inorganic substance. This is a tissue which Tomes has said was produced solely by the destructive action of weak acids, but that his conclusions are erroneous is proven by the fact that this tissue appears in sections where no acid has been used. It is a tissue formed by the coalescing of minute, globular bodies, calco-spherites, into globules and layers of a tissue that is called calco-globulin. The minute globules, in forming the matrix of cementum, seem to come from the osteoblasts and form the calco-globulin layer in somewhat the same manner as I have described and pictured in the developing dentine. The smaller globules, by merging into each other, form larger ones. They have a glistening appearance, like fat cells, are about the size of the osteoblasts, but are not cells, though often taken for them. They have no membrane and are without a nucleus. They are the bodies which Tomes and others say become fused together by their exteriors. Outside of the layer formed by the globules, the developing matrix of the cementum, we see a row of cells, which Rollet stated looked like an epithelium. They are the osteoblasts or cementoblasts, and the granules that have been described in their substance are very minute calco-spherites, which the cells give out to the forming matrix. Tomes has called them osteal cells. They are the same in appearance as those we see around the edge of the developing bone of the jaw. Just exterior to these cells we find roundish, nucleated cells with innumerable processes, reminding one somewhat of a stellate reticulum, only that the stellate character is not so marked. Just outside these we find the connective tissue which is really the perios-

teum. If there exists at this time a special cement organ, it must be formed by this slight amount of stellate tissue which is between the periosteum and the layer of osteoblasts that are against the forming cementum. In preparing my tissue, so as to have it as near life as possible, I made use of the same methods as were described in my papers on the development of the dentine and of the enamel, and I find that the osteoblasts, which are said to be full of a peculiar granular substance, are, when the tissue has been properly prepared, found to be filled with minute spherical bodies, which have a glistening appearance. Across the developing matrix of the cement are found numerous fibres, probably connective tissue fibres, that are also found in developing bone. They were seen and described by Sharpey and are named after him, Sharpey's fibres. They become calcified within the matrix. As the cementum grows thicker we find that the developing matrix is infolding in its substance large nucleated bodies which appear to be connective tissue corpuscles. They are somewhat larger than the osteoblasts and are forming the cement cells, or lacunæ. They have a higher function than the osteoblasts, that is, they are to give nourishment to the matrix, being connected with others by means of canals or processes, of which there are many, some of which run in the direction of the termination of the dentinal tubes, as though connected with them. When enclosed by the developing matrix of the cement, minute, glistening, globular bodies are seen within their outline, or membrane; indeed, it appears as though these minute globules were deposited on the periphery of the cell by the cell itself and here fusing give the cell its peculiar characteristic shape, which is not as regular as that in bone, and is oftentimes very much larger. Their processes, probably anastomose, with the dentinal tubules through the inter-globular spaces of the so-called granular layer, although I have never been able to trace them. I look upon the granular layer itself as a condition caused by an arrest of the developmental process, while the first layers of dentine were being formed. It has its existence solely from the fact that in the first forming layer of dentine the globules of calco-globulin which form its matrix did not fuse together. It is exactly identical to the inter-globular spaces found in the crown. The point that I would emphasize in this paper is that the matrix of the cementum is formed from a secretion of the osteoblasts, and this secretion is a multitude of minute globular bodies, given out against the dentine. In a work entitled "General Biology," written by Profs. Sedgwick and Wilson, they make a statement that the matrix of a tissue is composed of lifeless matter which has been manufactured and deposited by the living protoplasm constituting the bodies of the cells; and,

again, cells may manufacture a lifeless substance which appears in the form of solid partition walls between the cells, or as a matrix solid or liquid in which the cells lie; and, again, the cells are small masses of living matter or protoplasm which deposit more or less lifeless matter either around (outside) them or within their substance. The lifeless matter which is given out by the osteoblasts to form the matrix of the cementum is in the form of these minute globules, and these fusing together form larger ones, which merging form layers of an uncalcified substance that Prof. Harting has named calco-globulin; this is by further calcification to become the calcified matrix. In speaking of the formation of exostosis, Tomes states that at the junction with the root he finds a substance that is dense. It is torn with difficulty, and under pressure slips about between the two glasses. It is gelatinous, osseous matter, and with it may be seen rounded, amorphous molecules. This is a good description of calco-globulin. Tomes says that the cementum is not developed by a direct metamorphosis of the periosteum, but by the calcification of a new growth. Cells are produced, the individuality of which becomes lost in the process of calcification; the interior of the cells seems stuffed with an opaque and dense substance disposed in large granules, among which the nuclei cannot positively be pointed out. The large granules within the cells are really calco-spherites and careful preparation of the tissue will clearly show them. The merging together of these globules forms a layer and this calcifying, layer after layer, gives to the cement the peculiar laminated appearance that is so often seen. It is by no means difficult to trace evidences of this globular formation in the cementum of fully formed teeth; indeed, I have several sections of human teeth that show the outlines very clearly—so clearly in fact that one might call it the interglobular spaces of the cement, probably caused from some arrest in the full development of the tissues.

Dr. Marshall: Mr. Chairman, as I feel I shall be obliged to absent myself, I wish to make a report from the nominating committee, for Chairman of the Section, Dr. Taft, of Cincinnati; and for Secretary, Dr. E. S. Talbot, of Chicago.

Dr. Taft: I would rather that some one else would accept. I do not absolutely decline, but think some one else can hold the position better.

Dr. Talbot: I think it will be necessary for the committee to confer with each other still further, and while they are conferring, we can hear a discussion on the paper.

Dr. Andrews: I understand it is necessary to vacate this room at 5:30.

Dr. Talbot: We have ascertained that is not the case. So we can discuss this paper.

Dr. Taft: I want to make a remark in refer-

ence to this matter. Dr. Andrews referred to what are ordinarily termed globular spaces, and gives the location as between the enamel and dentine.

Dr. Andrews: Not between the enamel and dentine—just within the dentine.

Dr. Taft: I know; I understood you to say this position has been taken by others, that they located the inter-globular spaces in this granular layer, but that is not the location nor the appearance as originally described by Czernack, as recorded by Kölliker. If the structure denominated inter-globular spaces is to be found in the granular layer, then what is this globular structure within the dentine?

Dr. Andrews: The one is like the other, with this difference: the calcified globules near the cementum are small, while in the dentine of the crown they are much larger.

Dr. Taft: We have not ordinarily applied the term inter-globular space to this layer between the enamel and dentine. In some instances there is a very large mass of it, of considerable thickness. Another peculiarity of that layer is, it seems to consist, whether of thick or thin, of mere little globular granules. In some instances here seems to be tubuli, or something of the kind, extending through it to a very considerable extent. I wish I knew more about that than I do, and about the inter-globular spaces.

Dr. Andrews: Inter-globular spaces are found with the globules, in layers, the layers of formation, some near the enamel, others nearer the pulp. In the teeth of some fishes, the whole matrix is globular. In the human tooth, it is in evidence of lack of nourishment while the tooth is forming. The globules do not fuse, they are arrested and calcified as globules, not forming a perfect layer of matrix. The substance between the globules is not a calcified substance. Some teeth have very little, some have no evidence of a granular layer, so-called, others have a good deal. Some have hardly a trace of what we call inter-globular spaces in the dentine of the crown, others will have a large amount. It is an arrest in the developmental process in the formation of the tooth while it is forming a layer of matrix. For some reason, the globules have become calcified while in the globular form, before they have fused together. The tissue of inter-globular space is not fully calcified, while the globules always are.

Dr. Allen: This theory of Dr. Andrews', which I believe he does not stand alone in, is one that I think we should place in the status of the old Scotch law allowed, when a person is tried, and was neither innocent nor guilty—was not proven. The three structures of which the two substances are composed, enamel, dentine and cementum, are as diverse in their character and structure as any three tissues well can

be. According to this theory of Dr. Andrews, all three of these substances, materials or tissues, that is, the matrix of them, have a like developmental basis.

Dr. Andrews: The lime base of the matrix material, the basis substance, is the same in all. It is the calcified tissue.

Dr. Allen: All three are formed from cells, which have special duties required of them. Enamel is only 2 to 4 per cent. animal basis, 96 to 98 per cent. mineral. Dentine, again, is 30 to 40 per cent. animal, the balance mineral. I have examined a great many of these specimens of Dr. Andrews', and I have endeavored to see exactly as he sees, and I think I do see what he sees; but I don't interpret it as he does, for this reason: The material, whatever it is, the calcosglobulin, is thrown out in the shape of little globules, which vary greatly in size and character. The position may or may not be a vital condition. All these preparations of Dr. Andrews' were made with the greatest care, and from sections as little changed in preparation as possible. The calcification was produced by a very weak solution of acid, and every care taken to change the tissue as little as possible; but—and I hope I may be excused in saying so—it is not proven that these are not post-mortem appearances; and a long series of experiments will have to be carried on to prove whether they are post-mortem or living appearances. You do have unmistakable indications of these globular layers; and they are beautifully shown in these preparations. These appearances are not constant; you see them now, and again you don't.

Dr. Andrews: I have been speaking of the matrix substance, not its animal base; that is another matter. The globules are always present in my specimens.

Dr. Allen: But the main point I wish to show is, that I do not see whether this cannot be, in a measure, post-mortem appearances. I do not see why the fluids that have been used in preparing the tissues, the glycerine in which they are mounted, may not have some cause in giving them their characteristic appearance. It is a most interesting point, whether the two kinds of cells that go to make up the formation of dentine, really exist or do not exist, one the fibre form and the other the matrix forming. We often see appearances that would indicate double or dual nature of the cells that form dentine. In enamel it is not so. We do not often treat, and we seldom see, dual character of cells. To be sure, the enamel is so totally different, that the one form could be dispensed with; but in the sement magann it could not be. There we have a large mass of animal matter, and we have a composite structure, dentine.

Now, so far as these inter-globular spaces are concerned, Dr. Andrews specimens were taken

under high power. The inter-globular spaces in dentine are vastly different in size from those inter-globular spaces that Dr. Andrews threw on the screen. Take a tube and make a section of it, and you will find inter-globular spaces sometimes; I should say they would extend across nearly one-tenth of the thickness of the tube. Those globules are much smaller than the average size of the inter-globular spaces you find in dentine.

Now I am not saying that this theory is not true. I believe that the evidence Dr. Andrews offers is very strong and confirmatory evidence. I only say there are still some points open for investigation before we can say proven and adopted. I don't know of anyone in the profession who deserves greater respect than does Dr. Andrews, or who has done more disinterested work; and the results have been certainly most gratifying. I can say this heartily and truthfully; and I know of no one who has given his specimens more freely and generally to others for the purpose of examining them.

Dr. Taft: I wish more attention was given to the discrimination of these two conditions as just indicated by Dr. Andrews. The large spaces within the dentine that are ordinarily denominated globular spaces are very different in size from any condition that is found in the granular layer. In the granular layer these little spheres are granulous and thoroughly calcified. This peculiar structure, abnormal structure, in dentine marked by these lines in a greater or less degree, is defective structure; and then these circles or segments of circles that is within dentine that is not in a normal condition, occasionally you find deep lines running through that, and in some of them no organization of that kind at all.

The globules are thoroughly calcified. The inter-globular space is not perfect, but the globular spaces are perfect. The tissue between the globules is not calcified, but the space between the globules is soft. I assume this matter is clear to Dr. Andrews, but I wanted him to make it clear for me and for all of us.

Dr. Andrews: If you will examine sections of teeth where there are inter-globular spaces, you will find the globules are calcified. In dried sections, the spaces between the globules will show dark under the microscope, in the same way as the tubes do. It is because the spaces are not calcified, and when dry they fill with air. Some of the globules are only slightly attached to the matrix, while others show only a portion of their contour.

Dr. Allen: Do I understand you to say that this is a secretion?

Dr. Andrews: It is supposed that the line in the form of minute calco-spherites, comes from the blood. These pass through the cells, and are seen to be merging together forming larger

globules, or mulberry shaped masses, and these fusing form the perfect layer of matrix, if there is no arrest of development, while they are in this stage.

Dr. Taft: You make the point, it was arrested in development?

Dr. Andrews: Yes, when inter-globular spaces are found.

Dr. Taft: You mean that the environments are not perfect?

Dr. Andrews: Yes sir.

Dr. Marshall: Mr. Chairman, the nominating committee beg leave to report Dr. J. Taft of Cincinnati for Chairman, and Dr. E. S. Talbot for Secretary of the Section.

The report was unanimously adopted.

Here the chairman calls on Dr. Grady to read his paper on "The Use and Abuse of Dental Charity."

DENTAL INFIRMARY PATIENTS: THE USE AND ABUSE OF DENTAL CHARITY.

BY RICHARD GRADY, M.D., D.D.S.,
BALTIMORE, MD.

My object is to call attention to the abuse of dental charity, to illustrate its magnitude, and to protest (as every honest and independent man who wishes well to the profession and its respectability should) against the looseness with which dental colleges dispense their so-called charity—to "condemn the fault and not the actor of it;" for silence would give an indirect connection to practices which are lowering the profession in public estimation in the tendency of dental infirmaries to pauperize the people and to defraud dentists of rightful fees. So, judging of the proprieties and obligations of my position, I place the statements—dental infirmary patients: the use and abuse of dental charity—together, and propose to consider them in connection, because the evidence in regard to them constantly mingles.

You, gentlemen, familiar as you are with recent medical literature, if not appalled at the rapid growth of the dispensary evil, fully realize that it is an evil, that it is taking the means of livelihood from many deserving men, that it is growing, and that it must be combated to be kept within proper bounds.

The sorrows of our cousins across the ocean have been told you in the medical press. "The dispensary abuse in other lands," "the startling excess of medical charity in Edinburg," "the abnormal growth of the out-patient department at Cambridge," "the great and urgent question of hospital reform" in Birmingham where the out-patient of hospitals "have advanced in 20 years—1867 as compared with 1887—from 67,000 to 166,000," etc., have been commented upon. "Al-

most one-half of the people of Edinburgh, Scotland, receive their medical advice gratis. (The population is little over 236,000, and 103,095 dependent on charity for medical advice!) Nor is this all. The number of persons who in any year actually avail themselves of such aid must of necessity be smaller than the total number who would do so were they forced by sickness or accident; and it looks as if more than half the population were in the habit of expecting medical treatment gratis."

"In the city of New York wealthy hospital magnates are teaching the people the lessons that they have already learned in Edinburgh. In New York the amount of free work done in hospitals has increased 90 per cent. in the last decade. In time the hospitals may become as much an enemy to the general practitioner as the dispensary is. A western medical editor, who, last summer, visited some of the hospitals and clinics of the great metropolis, is quoted in the discussion of the question, 'Should a poor man study medicine?' as saying: 'What was most striking, outrageous as it is, was the great number of well and fashionably dressed, evidently well-to-do people, both male and female, who applied for free treatment. At the ——— on Tuesday, August 12, there were 568 patients, and judging from their appearance we venture to say that three-fourths, at least, of them were abundantly able to pay for private medical service. We have, of course, heard the numerous complaints among the New York physicians on this account, but we were not prepared to witness the spectacle presented there of gayly-attired, semi-aristocratic humanity going in droves, petitioning for free prescriptions, free medicines. The profession in New York would be justified (he says) in arising in emphatic and effectual protest against such wholesale diversion of their revenues.'"

Why do I recall these things? Not simply to remind you that this coöperation of the medical journals with the medical profession is an excellent example to the dental journals and the dental profession, but rather to emphasize the fact that what is true of the medical profession is, to a considerable extent, also true of the dental profession. As far back as March, 1889, I wrote to the *Dental Cosmos*, to ascertain if anything on dental charity had ever been published. The reply of the editor was: "I do not recall that the subject has been discussed in any dental journal, and I feel quite confident that it has not been in the *Dental Cosmos*. The subject is a delicate one, because it concerns a natural but sometimes professional rivalry between dental schools in the same city."

It is an encouraging sign of the times that, as Baltimore is the city in which regular collegiate instruction was first given in dentistry, so Baltimore dentists, appreciating that it is but seemly

for the profession to avoid and suppress, as far as possible, the rapidly increasing source of pecuniary loss through a channel of their own making, have become the pioneers in the reform of indiscriminate service in dental college infirmaries, which reform will, in no small degree, benefit the dentists in that city and in other cities.

Concerted opposition to dental infirmary abuse has been organized in Baltimore, and the Maryland Dental Protective Association, composed of a majority of the practicing dentists in that city, not including those pecuniarily connected with dental schools, came into existence in February, 1890, the object of the organization being to regulate the administration of dental charity so that the greatest good may come of it. The members, believing that the impulse must come from the dentists rather than the colleges, are doing what they can to obtain an abatement of the evil which is making such inroads into their practice. Nothing, thus far, has resulted from the movement, except the adoption of the following resolution:

"That each of the dental schools be requested to place in the infirmaries (near the entrance) record books, in which shall be printed in bold type on each page, 'For the poor only,' and in which shall be entered the name and address of all applicants for dental services. After such registration, each applicant shall receive a card, also headed, 'For the poor only,' if he or she admits inability to pay the usual office fees; all others shall be rigidly excluded from infirmary privileges. This card shall be retained by the patient, and presented at each visit, and until the completion of all necessary services; when the card (endorsed by the operating student with his statement), shall be returned to the demonstrator and placed on file. The record books and the cards shall be open for public inspection at all reasonable times."

The President of the Association has also visited the Mayor of the city, to request that no appropriations be made to the dental schools for 1891, unless in the contract there be included a provision that, 1, all applicants for dental services shall be registered; and 2, that the record books shall be open for inspection. Appropriations of \$400 and \$500 had been made in 1888 and 1889 to one of the dental schools, "for supplying medicine to the indigent sick of the city of Baltimore."

In what follows, I wish it to be understood that I have no reference to any special college. My remarks, I think it not improper and possibly not unimportant to say, are addressed to the system generally. Many of the facts are calculated to arrest the attention and engage the study of the best men in the profession.

Believing that every reform was once a private opinion, and acting upon the advice of Emerson, that "that statement only is fit to be made public which you have come at in attempting to satisfy your own curiosity," I, judging it expedient to gather light from quarters deemed trustworthy, wrote to deans of dental schools, to determine whether dental college infirmaries truly deserve

the designation of charities. The general result of the inquiry confirmed the impression that there is an enormous abuse of so-called dental charity by the almost reckless admission of all comers, and that the practice of some colleges is large and pecuniarily profitable.

As no man's personal rights are in the issue, I give you some of the information elicited as to infirmary charges and infirmary practice:

1. "Our infirmary privileges are extended only to those unable to pay the usual office fees (all others are rigidly excluded); gold fillings 75 cents to \$2.50, amalgam and other plastics 25 cents to \$1, vulcanite (full upper or lower) \$5.50, gold or continuous gum \$25; no record of charity patients to whom relief is extended without fee other than extractions and pathological cases;"
2. "The charge made is intended to cover actual expense of materials used, and whatever may be used in a charitable way; there is usually a surplus of receipts over expenditures; minimum charge for filling with gold 50 cents, for dentures \$6; these amounts vary of course if a larger quantity of material is used or in the case of dentures being made on metal bases;"
3. "The dental college charges simply for material used in plugs and dentures and tries to avoid doing for people who are able to pay regular dentist;"
4. "We average about 8,000 patients of all kinds yearly; charge for gold fillings and other work about what material costs, estimating rather over than under, as we can't afford to lose by our good works;"
5. "The fund we collect from our clinics amounts to about \$5,000 per year of ten months, which we are in operation;"
6. "Charges are slightly more than cost of material; we aim to have the infirmary self-supporting;"
7. "We try to have the charges for material used cover the waste and as much of the running expenses of infirmary as practicable;"
8. "Gold for about 1,000 patients, for which a profit is charged; make no distinction in patients;"
9. "No regular tariff for services; endeavor to discourage well-to-do, by making charges higher than in office;"
10. "Charge for gold filling about one-half what dentists charge;"
11. "Our purpose is to make infirmary self-sustaining," etc.

The time-work—the only legitimate work—of dental colleges—should be to educate students for professional life, to perfect the professional education of the dentist. But this preliminary training should not be used, as it sometimes is, to lower the dignity or emoluments of private practice. For pecuniary interest, some faculties attract as many students as possible (over 3,100 were in attendance at the various dental colleges of the country for the session 1890-1891) whom they send forth in the spirit of rivalry into the ranks of the profession without a thought that the means of subsistence for these men is diminished by dental infirmaries taking patients which these

graduates should have, that having raised up these men to professional life they have the further duty not to pull them down, and that they are warring upon the livelihood of their professional brethren with the inevitable result of all active competition—lower prices; with the prospect that, as the ranks become more crowded, the competition must become keener. Is it any wonder, then, that men often lose heart after struggling for a time against so powerful and so unscrupulous a rival as every dental college infirmary is, whose anxiety for abundance of clinical material is so pressing that there is no discrimination, or hardly any? and that men of talent and respectable professional ability are forced to adopt rates that will in a measure compete with clinical fees in order to secure at least a moderate share of practice, or be driven out of the profession to find support in some other occupation for which they are wholly unsuited by reason of long years devoted to professional labors? Have members of the dental profession no feelings which influential dental colleges are bound to respect?

More than 50 years ago, as you know, the *first* dental college was founded. It was the purpose to give the institution a high character at the start. After it had become necessary to establish an operating infirmary, "for the benefit of the students," this announcement was published:

"There exists abundant opportunity for practical instruction in the Dental Infirmary attached to the institution. The appreciation and consequent demand of such operations as are here performed is steadily increasing among the indigent of our city. It may be necessary to add that these operations are not performed by the professors in the presence of the class, but by the students themselves under the immediate eye and direction of their instructors. In fine, the object of the institution is to perfect the professional education of the dentist, which may or may not have been begun under some competent private instructor and which, it is recommended, should be pursued during the summer vacation in some dental office."

Has the stamp of character the infirmary then received, endured? Have the purposes of the originators of the dental infirmary, who started it not as a money making experiment but for the benefit of the students and as a humanitarian agency, been perpetuated in all the dental colleges which are pleased to acknowledge their origin? Are "operations performed among the indigent" only? Are dental colleges actuated solely by a desire to do good to the very poor? Is attendance at the dental infirmary taken by all the patients as a confession of poverty? Is it customary for students to be found "during the summer vacation in some dental office," or are they to be found at the college filling teeth and

making plates for the pecuniary profit of those who, in the language of students, "Run the infirmary for what they can make out of it?"

The origin of the dental infirmary has been told you; the evolution of the abuse can readily be traced.

1. "Operations among the indigent"—"all expenses borne by college."

2. "Students have the privilege of operating upon their own private patients."

3. The natural development has been that services have been rendered infirmary patients who could pay a proper fee; that "during the sessions, the operative and mechanical departments are now so well patronized, that every student can obtain as much practice as it is possible for him to attend to;" that "the clinical material is abundant, there being an excess of patients;" that "*the practice for dental students* has increased to such an extent that all the students, during the past session, have had an abundance of practical work, in both operative and prosthetic dentistry—the record books showing to the credit of many of them *hundreds* of gold fillings inserted for infirmary patients, besides other operations. This means for practical instruction has already assumed such large proportions that the supply has been beyond the needs of the large classes in attendance during the past sessions."

That the competition of some dental college infirmaries affects to an appreciable degree dentists injuriously, will be obvious to every reflecting person, at the bare mention that "about 25,000 patients are attended to yearly" by one dental college, and "on an average for nine months in the year, relief is extended to about 100 patients a day" by another; that one dental college which was "extending relief to more than 2,000 charity patients" in 1889, reported next year (1890) "more than 10,000 of such cases," and another which reported in 1889 "the charity patients number 4,312," in 1891 (two years later) gave the number of cases "12,000 or 15,000." None of these are located in the great metropolis whose college of dental surgery reports only about 6,500 patients are treated annually, (possibly because) "we charge for the material used in all branches of dental surgery."

This competition is most onerous to the dentists of least income, and to the practitioners who are struggling against the odds of cheap dentistry in an effort to maintain an honorable position, and eke out of their labors sufficient income for a respectable living. The dental infirmaries being open to all classes and conditions of men and women who desire low-priced services, few, if any, questions are asked, as long as the charges are paid, no matter how elegant and costly the habit, nor how many jewels displayed. This pernicious example of cheap dentistry is an injustice to those dentists who resist mercenary competi-

tion, and endeavor to render their bills in conformity with standard fees.

Are there not poor enough to supply clinical patients without encouraging the well-to-do to degrade the profession by responding to the enticing and seductive advertisement, "Many of the operations are performed free of charge, and all others at the cost of materials only," or the knowledge that "during the first two months of the session we furnish all materials to patients free of cost," although it may be said in excuse of the work done for them, "The operations are faulty and but the handiwork of students?" Is it not true benevolence and sound policy to remove, if possible, competition from those least able to bear it? If fair-minded men think so, if the faculties of the dental schools think so, then let the welfare of the whole profession supersede and extinguish the selfishness of the few.

A dentist who would endeavor to obtain practice after the model of the pretentious dental infirmary announcement (which appeals not in vain to the large number of persons who prefer quantity to quality)—"free to all—all operations known to modern dentistry performed in most workmanlike manner—gold foil and artificial teeth at actual cost—amalgam or silver, white, tin and gutta percha fillings free—this is the first time such an opportunity has ever been presented to every one to save those important organs (the teeth) free of cost—old and experienced demonstrators in charge—the same decorum will be observed as in private office, etc."—would be accused of unprofessional conduct, of acts unworthy the lowest grades of the profession, and set down among his fellows as unprincipled, a professional outlaw fit to "send to Coventry."

But, it may be asked, if a corporation of dentists may publicly advertise, why should a private practitioner be debarred? Should not dental faculties hold themselves amenable to professional laws, customs and courtesies? Is the sense of personal responsibility and personal honor depressed when the individual dentist is merged in the abstract entity of a dental corporation? However painful it may be to admit, it cannot be denied that methods which are legitimate for a dental college are not improper for the individual dentist, although claimants for public patronage may not see the question in this equivocal position after they have worked themselves into dental college faculties, by favor rather than merit, and thereby converted the dental infirmary into an ally instead of a rival. That, say what you please, is the plain English of the matter, and it may as well be spoken.

But the effects of the practice are not worse than the statements in the advertisements. One of the most pregnant counts in the indictment against the dental college infirmaries is that they advertise "gold foil and artificial teeth at actual

cost," when really the cost to the colleges for artificial teeth is absolutely nothing, the manufacturers "furnishing teeth to the infirmaries without charge, which teeth are sold in plates at (say) 2,000 per cent. above the cost of material used, and the gold foil is sold at a profit of 100 or 200 per cent. Dental colleges should give an equivalent for the fees they demand; to do *more* is charity, *less* is fraud.

Lest it should be thought I am making statements to suit my argument, let me quote what those think who ought to know best, from the opportunities of observation or experience. The views expressed by the gentlemen are creditable to their sense of justice, and will have such weight with the membership of this Association and with others as they are entitled to.

Dr. Shepherd, President Massachusetts Board of Registration, whose caustic criticisms are yet fresh in the minds of readers of dental literature, says:

Suppose one college furnishes only No. 3 gold in the infirmary, and sells each sheet for 70 cents, making a profit of \$60 per oz., and another college furnishes No. 4 gold, and sells it at 40 cents a sheet, making a profit of \$14.40 per oz., would it not be reasonable to infer that the former was run more for profit, and the latter more for the advantage of the student?

Has the infirmary answered its purpose when it has been successfully run as the Cheap John shop? Some colleges have sixty or seventy chairs. How many demonstrators are there present all the time? I ask any one who has had experience as demonstrator if he does not consider that he has been handicapped as an instructor by having too many operators to look after? Is it a rule in every college that no student shall ever commence the insertion of a filling until the cavity has been pronounced properly prepared by the demonstrator? This would seem to be a reasonable rule.

Are the demonstrators always selected for faithfulness and competency? Is a man who graduates one year generally competent to instruct a student the next year, to be the arbiter as to the how, what and why of the multifarious and complicated conditions that are constantly arising? Such young men, without practice, can be hired cheap. But does the college fulfil its contract with the student by having young and cheap instructors, in the infirmary least of all places, though the professors may divide several thousand dollars apiece each year?

The testimony of Dr. David Genese, who holds official position in two dental schools, is:

It is well known that persons amply able to pay (occasionally persons of known wealth), claim the attention of the students, and needed charity kept so long waiting that they depart or do not get the work done, as the charges are sometimes as much as a young practitioner will make. Where is the charity? and how does the dental infirmary compare this with only "cost of material?"

No student should be allowed to appoint time for people to visit him at the institutions. Every patient should be first seen by the demonstrator, and the work given in rotation to students. The name and address, and occupation of the applicant should be obtained, and if found able to pay, should be referred to a dentist, and not, as at present, charged full fees to go into the pockets of the professors and demonstrators.

Dr. Ferd Groshans, a demonstrator, is of this belief:

From personal experience at the dental infirmary, as student and assistant, I could cite cases of patients who were able to pay, and had their teeth filled and plates inserted, to their own disadvantage, as well as to the injury of the science of dentistry, both of which are due, in my opinion, to the want of a larger number of instructors, as well as to the inexperience of the new beginners. I think a less number of patients would be sufficient, and of more value to the student, if the instruction would be more of a personal supervision and more constant by the demonstrators in charge. I do not think a student should be left so much to himself as is the practice at present. The infirmary practice, as at present conducted, is detrimental to the patient, student, college, and the profession in particular, to say the least, and not considering the practitioner who must live by the legitimate practice of his profession.

These views a Vice-President of the National Association of Charities approved, and added: "We want fewer unworthy applicants, and a better service in the dispensaries."

Dr. J. L. Asay, of California, writing on "the pernicious effect of dental college clinics," says:

That such a condition exists was, to me, made apparent during my visit to the larger cities of the Atlantic coast, last year, but was not confined to any particular dental school. I found it, however, to predominate in Philadelphia, where there are no less than three dental colleges. It may possibly be that I observed this state of affairs more in that city than in other places, from the fact of my larger acquaintance there than elsewhere, it being my native city, and former residence for twenty-seven years, hence, other localities may furnish equal grounds for comment.

During the visit to which I have alluded, I frequently heard old practitioners complain of college operations and their fees. I heard men and women of good circumstances and comfortable incomes congratulate themselves and each other upon how cheap they had got their teeth filled or plates made at the dental college.

He continues:

We may rail against gas offices and bucket shops; five dollar sets of teeth, and "teeth plugged to last for life, for 25 cents," without avail, so long as we countenance the pernicious example of cheap dentistry and low fees by our institution of dental learning, to those who should be compelled to seek the services, if any be needed, of the regular practitioner, and pay a price equivalent to the time occupied and the skill employed.

This expression is confirmed by an official in Philadelphia, under date of April 30, 1891, who writes:

In this city, with its three large dental schools (having in attendance over 700 students during the last session) actively competing for patronage, the evils of indiscriminate charity are seriously felt by a large number of worthy practitioners. Such charity certainly tends to cheapen the services of the dentist, and in many cases causes young graduates to resort to questionable methods of obtaining a remunerative practice. The question is of vital and timely importance.

In conclusion, what is the duty of the hour? What, it may be asked, do members of the dental profession propose for the evil which they allege to exist so much to their prejudice and detriment? Is it to close the dental infirmaries? Not at all, except, possibly, during the vacation when no lectures are delivered, because in our present social condition the dental infirmary may

be necessary (I will not say necessary evil). They suggest a cure more humane, more salutary, more manly, more worthy of them. It is that dental infirmary privileges be extended only to those unable to pay the usual fees of dentists because it is believed that the practice of dental schools in throwing open their doors to whoever may apply, injuriously affects both the public and the dental profession. (The testimony upon this point is so honorable to the dentists of Baltimore that special attention is invited to it, as it has been affirmed and re-affirmed by members of the Maryland Dental Protective Association, and is in fact the sentiment that led to the organization).

Very true, you say, but how is it to be done? If a line could be drawn, where would you place it? I suggest the following for consideration, as possible remedies; other thinkers may be stimulated to supplement what has been omitted. Oneness of aim does not imply identity of means.

1. Go back to the practice of the time-honored pioneer—an operating infirmary “for the benefit of the students”—operators “among the indigents” only “by the students under the *immediate eye* and direction of their instructors”—“all expenses borne by college.”

2. Let no “students have the privilege of operating upon their own patients (private) during the sessions” either at the college or at their homes.

3. Provide for dental infirmary privileges to persons recommended by dentists, or by some inquiring agency, familiar with the circumstances of applicants, similar to the Charity Organization Society, of Baltimore.

These are simple suggestions, and it only remains for the dental colleges, more especially rival institutions in the same city, or those which aim to “have the infirmary self-supporting,” or “have a surplus of receipts over expenditures,” to put them in practice. Even if it had been found difficult to devise remedies, the calling of public attention to the evil would have been useful.

Some dental colleges, to their honor be it said, already discriminate; as for instance the University of California College of Dentistry whose rule is “Infirmary privileges are extended only to those unable to pay the usual office fees” (all others are rigidly excluded); or the Philadelphia Dental College which “tries to avoid doing for people who are able to go to regular dentists;” or the Indiana Dental College, which uniquely “endeavors to discourage well-to-do people by making charges a little higher than those ordinarily made in offices;” or the University of Maryland Dental Department, “whenever it is possible to discriminate, the patients supposed from general appearance to be in good circumstances (as we have no other means of judging as to financial ability) are rejected in favor of the poorer classes of patients. We shall continue to

pursue this course as an act of justice towards the dental practitioners of the city of Baltimore and the State of Maryland.”

The interests of the dental profession and of the dental colleges are really identical, and they should be made practically so. At present there is a combat between those with whom unanimity of purpose and honesty of intention should prevail. Each sets the other at defiance, and as a rule, there is little kindly feeling and few friendly acts on either side. It would be otherwise if the graduates of dental schools, instead of having to suffer from acts prejudicial to, or sometimes injurious, to their interests, were made the objects of a generous, parental care. Such consideration would dispel antagonism, and the charity of the public could be confidently appealed to, with the support of the profession, notwithstanding there would be (apparently) a falling off in the number of patients at the dental infirmaries.

This is an age of associations, hence it is desirable that the State societies be formed which shall coöperate in protesting emphatically against the abuse of dental charity and in taking effectual measures for its correction, so that in case of application for State or municipal (financial) aid on the plea that “the faculty are receiving now scarcely any remuneration—they ask that they be relieved from the cost of the very charitable institution which they have necessarily connected with the college;” or “the faculty find themselves compelled to ask aid from the State—they are not willing that the institution shall perish without giving the State an opportunity to preserve it,” it may be made known that no such assistance is given in the cities of Boston, New York, Philadelphia, Washington, Chicago, Indianapolis, Cincinnati, Louisville, Minneapolis, San Francisco, by the taxpayers to the dental schools.

The paper was discussed by Dr. Taft of Cincinnati, Dr. Clara McNaughton of Washington, Dr. J. J. Williams and R. R. Andrews of Boston and E. S. Talbot of Chicago, after which the following resolution was unanimously adopted:

Resolved, That this Section would suggest to the National Association of Dental Faculties, the importance of some action towards correcting any abuses of the charities of infirmaries or schools.

Dr. George W. Whitefield read a paper on

PATHOLOGICAL CONDITIONS PRODUCED BY GALVANIC ACTION BETWEEN DISSIMILAR METALS IN THE CARE OF TEETH.

and then illustrated some of the points in his paper by an exhibition of electrical apparatus.

To arrest the causes that destroy the teeth,

fillings of different kinds have been and are being used to repair the loss of continuity of tooth structure, to protect exposed parts, and restore the contour of the organ. Prominent among these filling materials are gold, tin, cements and amalgam, or, as it is sometimes called, silver. It is composed in varying proportions of tin and silver, with a small amount of gold or platinum amalgamated, as the term implies, with quicksilver. There are also amalgams of copper, and some containing zinc.

In a general way, I will now introduce the subject of this all-pervading mysterious form of vibration we call electricity. Different qualifying names are employed to designate the kind of electrical manifestations, as magnetic, frictional or static, galvanic, voltaic or dynamic and thermal electricity.

We find that all molecular disturbances give rise to disturbed electrical equilibrium; all motion tends to produce this condition. We notice the result only when the conditions are favorable, that is, when the conditions are such that the equilibrium is not too easily reestablished.

Electricity is termed positive (+) when it has force to impart, negative (—) when it will require such an amount of electrical energy to restore the electrical equilibrium. The difference of electrical conditions is termed the difference of potential.

Difference of potential is a difference of electrical conditions, by virtue of which work is done by the electrical vibrations in moving from the point of higher to that of a lower potential, and is measured by the unit of quantity of electricity thus transmitted.

The passage of electrical vibration from the point of higher to that of lower potential, is termed electrical current, and the bodies along which they pass are conductors. The opposition to the passage of the current is termed the resistance.

In order to understand the action of what is called electric current, I will give the familiar illustration of two reservoirs of water connected by a pipe. The electric current may be likened to the flow of water through this pipe from the higher to the lower level. The unit of current strength, also called the rate of flow or intensity, is the ampère. In the illustration we would say the water is flowing through the pipe at the rate of one gallon per second. In speaking of the electric current, we would say it has the strength of, say one ampère.

The unit of electromotive force, also called electrical pressure, or tension, or difference of potential, is the volt. In the illustration the head of water, or the difference between the levels A and B, is similar to the electromotive force.

The unit of resistance is the ohm. Resistance

may be compared to the friction the internal surface of the pipe offers to the water. It follows that the more cross-section the less friction, and the less cross-section the more friction, for the same volume of water flowing through the pipe in a given time.

Conductors are good or bad as they convey or resist the passage of the electrical current; different metals vary in their conductivity, silver and copper being high in the scale, while German silver and steel retard the current; moisture is a good conductor, while glass, kerite, rubber and dry air are among the poorest conductors; the resistance varies with the length of the circuit, the conductivity and cross-section of the conductors.

As the current is the same strength throughout its entire length, it naturally follows that the larger the conductors, other things being equal, the less the resistance, and on the other hand, the lessened surface or poorer the conductor, the lessened current and reduced activity of the battery. When the current is too great for the conductors the wave length is shortened to that of heat, which varies according to the current and the conductors. The wave length may be shortened to that of light vibrations so that the conductors may glow as in the incandescent lamp or cautery snare. Heat generated in this way is now employed in electric welding, and for the fusing of metals requiring a high temperature, such as platinum, iridium, etc.

Magnetism derives its name from the place where magnetic ore was first found—Magnesia, Asia Minor.

Frictional or static electricity, is of but little interest to us as a profession, although often, in a dry atmosphere, it may be a very annoying companion by the dental chair, when each movement of the operator produces by friction a difference of potential between the operator and the patient; then if the discharge is by way of an instrument to a filling, or moisture in a cavity of a tooth, the result, to say the least, is unpleasant, and often quite startling if the patient, by jumping, upsets the instruments.

Frictional electricity is to galvanic electricity, what a red hot needle would be to a large, moderately heated crow-bar; the crow-bar contains more heat than the needle, but one has a volume, the other intensity. Frictional electricity is so intense that it will jump through air, the length of the spark being governed by the intensity of the current.

Galvanic electricity, on the contrary, will traverse the circumference of the globe, rather than leap a short space. Galvanic, voltaic or dynamic electricity, is the particular manifestation of this force, most interesting in a practical way, to the dentist. The current derived from the battery is called galvanic or voltaic, in honor of the experimenters who, less than 100 years

ago, discovered the method of generating and collecting the force through chemical action. It is this manifestation of electrical energy that is employed in the arts, consequently the name dynamic.

Where the extensive use of electricity is required, the dynamo is employed for economical reasons.

Batteries consist of positive (+) and negative (—) elements, immersed in an exciting fluid, or fluids. The fluid employed varies according to the construction of the battery, and kind of work to be done, being acid or alkaline; though even pure water will generate a current, if two metals are immersed in it where one metal is more readily oxidized than the other. (Note the fact that action would take place if the elements were composed of two samples of amalgam, if one was composed of less oxidizable metals than the other).

The positive (+) element of the battery is the one on which the exciting fluid acts, that is, the fluid destroys the positive (+) element, molecule by molecule, while the negative (—) element should sustain no loss of structure. If the negative (—) element is acted upon by the fluid, counter currents are generated which interfere with the usefulness of the battery. I spoke of the resistance of the conductors; the fluids of the batteries impose resistance, termed the internal resistance. The electrical energy of a battery is the energy of the current, less the internal resistance, and the resistance of the circuit. The resistance both internal and of the circuit, modifies the action of the battery. If the elements are connected with wire of sufficient size to convey the current, the electromotive force will be reduced in proportion, as the length of the wire is increased, or the size (cross section) of the wire is reduced; while, if the elements touch in the fluid, the action is most violent, and the batteries soon become polarized, that is, the surface of the elements become so changed that the fluid ceases to affect them or the fluid becomes so saturated with the waste product of the combustion of the positive (+) element that action practically ceases, unless provision is made for it by having the fluid constantly renewed, as in some kinds of batteries designed for constant work.

When the circuit is opened shock is felt, if the current is of sufficient strength; this shock is the result of the magnetic energy being suddenly discharged; different devices are made use of to produce this result, such as the induction coil, constructed with a vibrator, which rapidly makes and breaks the circuit; an example of this is the medical battery, and the Ruhmkorff coil; the current produced in this way is called the faradic.

Now, to apply the foregoing to the battery formed by dissimilar metals in the mouth, where

the fluids of the mouth are the exciting media, gold will be the negative (—) element, as the fluids of the mouth have no action on this metal. The positive (+) element is the baser metals, whether used separately, as tin, or, as most commonly, the combination of mercury with tin, silver, zinc and copper, as in the amalgams in use.

With gold and tin to form the voltaic pair, the base metal soon becomes coated, and the current practically ceases, but with amalgam, the mercury performs the same office in the mouth that it does in the laboratory; it presents the metal in a form that is easily acted upon by the exciting fluid.

We always have good conductors in the fluids of the mouth, containing, as they do, mucus and various earthy salts, while often the fillings touch in the same mouth, or as approximal fillings of gold in one tooth, and amalgam in another.

We always have good conductors, although the resistance varies in each individual case, according to the character of the secretions, or the situation of the fillings.

The action will vary according as the conditions are changed. Naturally, where food is left between the teeth, to decompose, the acid resulting from such fermentation will form a more exciting medium than normal alkaline saliva. Where a filling is left rough and jagged, overhanging and irritating the gums, it presents an exaggerated surface to be acted upon; besides, by irritating the gums, it causes a secretion from them that forms an excellent exciting fluid. This is, unfortunately, the too frequent result of careless operating.

Now, what of it? Is this only theory? Are these statements founded on scientific facts? Can they be established by proof? *The Western Electrician* of February 11, 1888, says, in reference to a talk I gave before the Chicago Electrical Club:

"Dr. Whitefield, before the Chicago Electrical Club Monday evening, succeeded in settling a question that has been in dispute among dentists, as to the electric action of amalgam and gold fillings in the same tooth, or even in the same mouth.

"That a current was generated by the amalgam and gold fillings when placed in water, even when they were insulated from each other, was conclusively shown by bringing a galvanometer into circuit. The point is one that may be combated, but the evidence produced by the galvanometer cannot be controverted."

Now if there is galvanic action, what harm can it do? Let us quote from an article on amalgam in the November *Dental Review*, 1887:

"Now the question arises: Shall we ever use amalgam and gold in the same tooth, and if so, why? and if not, why not? There has been such varied teaching in the past in regard to this subject, that it is time the old errors should be ex-

ploded, and scientific teaching presented to our students of to-day. The old way was to put both amalgam and gold in the same tooth, if it seemed necessary, but never let them touch each other, or grave results would follow. After seeing such methods pursued for a term of years, we find that, in spite of the teachings, grave results did follow, which ultimately resulted in the loss of the gold filling, while the amalgam remained comparatively sound, or, rather, the tooth structure surrounding the amalgam filling."

This is correct—but to go on and see the writer's following statements:

"We have found that if the two metals touch in the electric battery, there is no longer a current, it is dead, no shock is produced, and it is just the same when the metals are in the tooth in the presence of an acid, as it is out of the mouth in the laboratory. Therefore, we found, first, from an unpleasant experience, and later from theory, that if amalgam and gold are placed in the same tooth, they should have an uninterrupted communication, should be in complete apposition, so that no electric or galvanic action can take place, because they touch each other."

Let us consider these statements, and see if they harmonize with the laws of physics. Now, if the elements touch (the fillings), there is practically no resistance in the circuit, consequently the battery's action is most violent, up to the capacity of the battery to generate current.

The writer says no shock is produced. He is right; the current flows evenly through the short circuit, so the equipoise is practically maintained, and shock is produced only when the current is interrupted, when an accumulation of energy is suddenly discharged.

To be fair, I will essay to point out what has misled my friend into making these rash statements.

If gold and amalgam touch in the same tooth, there is practically less destruction around the gold filling. This is easily explained, as the galvanic action is so violent that the surface of the amalgam filling is soon destroyed; that is, all the baser metals are consumed from the face of the plug, leaving the silver, gold or platinum of which it is composed, on the surface, which practically changes the amalgam to nearly a silver surface, thus raising it to nearly a negative metal, while beside this, the coating protects even the surface of the silver.

This statement holds true with regard to very old plugs of amalgam; their surface is no longer amalgam, it is negative metal.

But at what fearful cost are such old fillings raised to the dignity of negative elements.

We will now note some of the harmful phases of this subject.

First: Galvanic action has a tendency to accelerate the blood flow, producing hyperæmia and hyperæsthesia, and in some cases violent ner-

vous phenomena. This is especially the case where, from the situation of the fillings, the energy is accumulated, then suddenly discharged, producing shock, as each can demonstrate by touching a bit of zinc or the blade of a penknife to a filling in your own mouth.

Second: The current is generated from all parts of the elements that come in contact with moisture, and are not protected by a coating. The portion of the amalgam filling that is protected by tooth structure becomes so coated that there is practically no action except on its exposed surface. On the contrary, gold remains bright on all its surfaces, and as moisture pervades the whole tooth, no matter how well the filling is inserted, moisture will reach it by way of the inter-tubular spaces, consequently electrolytic action can take place from all portions of the gold elements, naturally causing considerable destruction around the gold filling, and this is not all electrolytic action takes place. Among the commonest elements found in the mouth is chloride of sodium (salt); galvanic action readily breaks up this compound, the chlorine liberates oxygen and unites with the hydrogen of the water, forming hydrochloric acid, and leaving the oxygen in its most energetic state (other acids may be formed in this way, such as sulphuric, nitric, etc.). The electrolytic action, and the acids thus formed, are sufficient to roughen the surface of the teeth to give lodgment to colonies of "microbes."

Is this all? No. Chlorine, in its nascent state, will readily unite with the mercury of the amalgam, and the chlorides of mercury may be formed in sufficient quantities to produce symptoms of mercurial poisoning in those susceptible to its influences. These salts of mercury may also explain the immunity from decay of teeth stopped with ill-fitting amalgam plugs, the germicidal effects of the mercury being sufficient to prevent colonization by microorganisms, and consequent destruction of the tooth.

The oxygen might, from peculiarities of the individual case, unite with other salts than those of the teeth, and the same with the acids. We all know that the neglect some mouths get would be total destruction in others. The elements that usually produce decay would seem to be inert in their case, and the same condition undoubtedly explains why electrolytic action that would destroy in one case is apparently harmless in others, although such cases are in the minority.

The usual result of placing amalgam in the back teeth, while gold is placed in the front teeth, of children, will explain why the gold fillings have to be renewed so often; also, that in the electrical action is a clue to the oft-repeated tale brought to us by the laity, that amalgam stands better than gold, as the amalgam still remains, and the gold fillings, that have been replaced several times, are loose again.

If amalgam must be used, use those grades that will readily become coated, as the coating will reduce the galvanic action, protecting the plug from the fluids of the mouth, except where attrition and brushing keep them bright. Gold and amalgam, in fact any metal, should be avoided for teeth which are of such soft structure that the pressure produced in inserting gold would tend to break down the tubuli, while metals never stand well in teeth of very soft structure. In fact, you can as well expect to prevent water flowing under the edge of a board resting on the ends of the blocks in cedar block pavement in the street, as to expect to exclude moisture from a soft tooth with a metallic filling, as moisture is bound to penetrate between the tubuli. Even the normal plasma exuding from the tubuli will have a tendency to assist the destruction of the hard structure when it becomes vitiated, as it must in the temperature of the mouth, as it is a foreign substance when lost from the tubuli, as is the blood that weeps from abraded gum tissue.

The cements and gutta percha are the only filling materials that should be employed for filling such teeth. If you will use these materials, in the course of eighteen months or two years the tooth will be found quite hard, and capable of proper manipulation, to prepare it for the king of metals and the king of filling materials—gold. A tooth treated in this way will not be as sensitive, and the fillings will last.

Dr. Williams: In this experiment one element is amalgam. What is the composition of that amalgam?

Dr. Whitefield: Ordinary commercial amalgam. I don't remember its composition.

Dr. Williams: One point that I can see in this paper is, that what we have practiced can be verified by strict scientific experiments. I will simply say one or two words that I have noticed from general observation, and am convinced that amalgam with zinc is more liable to produce galvanic action than without zinc. Another point is, that in several cases where there has been decided galvanic action, I have found that the galvanic action was less or not existing at all by combining as large a proportion of gold foil with the amalgam as possible. It is on the theory in a general way that by mixing the gold, if there is gold filling near, it lessens the difference between the metals and so lessens the galvanic action; that is my theory, practiced on for years.

Dr. Marshall: I am interested in this paper, and also in the experiments, and have this to say of some experiments I have seen. Dr. S. P. Palmer of Syracuse, N. Y., demonstrated fifteen years ago, or rather I should say proved very conclusively that there was not only action between teeth structure and metal fillings, gold and amalgam plugs, but also between gold and tin,

and between tin and amalgam, but of course the action was not so great between the latter as between gold and amalgam. He also went considerably further than this in his experiments. He proved conclusively that a galvanic action was established between any two dissimilar materials when moistened with a solution of chloride of sodium or saliva producing a distinct deflection of the needle. Another experiment seemed very strange at the time; for instance, he was in the habit of taking two foods which we eat in pairs, as the most palatable, such as ham and fried eggs, a piece of mutton and tomato sauce, a piece of turkey and cranberry sauce, in fact he followed it all through the foods which we naturally eat in pairs as being most palatable, and he found that by moistening these with saliva that there was a deflection of the needle as a result. He then made this suggestion, that it was on account of this peculiar galvanic or electrical action present between certain dissimilar bodies or kinds of foods, zest of taste or relish is given; that by the decomposition of the saliva produced by the electrical action between the foods.

"How many of us ever tasted water as good as that of the well on the old farm. Dr. Palmer would ask what did you drink out of, the tin dipper? The contact of the metal dipper with the moist lip produces a galvanic current. That is the solution of it." I am inclined to think that there is a good deal in this. I just mentioned this to show what has been done experimentally in this very direction by Dr. Palmer. Most of you know that Drs. Palmer, Flagg and Chase were the three men who made up the new departure trio. Their idea was that gold was not always the best material to use in the filling of teeth; that sometimes amalgam was better than gold itself; on account of the low galvanic condition which existed between amalgam and some of the baser metals and tooth structure.

Dr. Williams:—There is one point in regard to Dr. Palmer's idea that I would mention which I think is a little wanting, because I think as a general thing, and certainly the poet so mentions it, that the most delicious flavor of water is from an "old oaken bucket."

Dr. Marshall:—Another point Dr. Palmer in his experiments also proves was that just as soon as the surface of the amalgam plug became thoroughly oxidized the electric current ceased. It was only in such cases in which the plug remained bright that this action continued. You all have, no doubt, noticed that when an amalgam plug has been placed in a tooth in contact with a gold plug, in a few days oxidation commences; and it used to be thought that we must leave a bridge or partition of dentine or tooth-structure between the two plugs, but we found after a time that the tooth at the cervical margins of the plugs was very soon dissolved

away, and that when you allow them to come in contact this condition did not occur.

Dr. Custer:—I think you might gather from this that the amalgam which oxidizes most easily will be the best.

Dr. Whitefield:—I made a statement that where amalgams oxidize rapidly they are best; zinc will never oxidize thoroughly. I will state the following cases: a patient came to me for treatment and while under my care she complained that the fillings that had just been inserted were giving trouble. It immediately called my attention to the electrical action. I removed the amalgam filling and in a short time all trouble stopped. Using amalgam in preference to gold in some cases has been suggested. In some cases they need a kind of a whip. There needs to be some kind of a stimulant.

Dr. Williams:—I would like to say that I hope that Dr. Whitefield will try a suggestion of mine which is to mix as much gold as possible and then to put it under test. I hope he will try it practically, scientifically and mathematically; not try to find a certain thing, but try to see what he can find.

Dr. Marshall's paper was next read:

THE RHEUMATIC AND GOUTY DIATHESIS, AS MANIFESTED IN DISEASES OF THE PERIDONTAL MEMBRANE.

BY JOHN S. MARSHALL, M.D.,
OF CHICAGO, ILL.

In nearly all our text books on dental surgery and dental pathology, mention is made of the fact that rheumatic and gouty individuals sometimes suffer from irritation of the peridental membrane, causing the teeth to become more or less sore and loosened in their sockets; supposedly the results of the peculiar diathesis of the system, but farther than this no light is thrown upon the subject.

Clinical and post-mortem experience teaches that the *materies morbi* of these diseases has a predilection for the fibrous structures of the body, especially the synovial membranes, the aponeuroses of muscles, the dura mater, the cardiac tissues, periosteal and peridental membranes. The one most commonly affected is the synovial membrane, resulting in inflammatory conditions of the joints.

It not uncommonly happens, however, that there is associated with the inflammatory phenomena of the joints, enlargement of the long bones and nodular formations in other localities; and in the peri-cementum, conditions which are somewhat analogous.

The predisposing and exciting causes of certain irritative conditions of the peri-cementum seem to have their origin in the same conditions which bring about the phenomena of gout and

rheumatism, and they have also proved by experience to be amenable, in many cases, to the same specific treatment adopted in these diseases. This last fact has led me to the belief that the rheumatic poison is largely accountable for many of the diseased conditions of the peri-cementum, and has induced me for several years to make close and careful observation in relation to the prevalence of irritation of the peri cementum in gouty and rheumatic individuals.

This belief has been further strengthened by finding upon analyzing the urine of a number of persons suffering from peridental irritation of this character, that there was a considerable excess of uric acid in every case. The saliva also, in many cases, gives a decided acid reaction.

The peridental membrane seems to be very susceptible to the irritating effects of an acid condition of the blood, whether from an excess of lactic or uric acids retained in the system or from the ingestion of such acids as are found in sour wines and malt liquors.

The habitual use of sour wines and malt liquors often results in peridental irritation of a marked character, in individuals who have never developed symptoms of a rheumatic condition; while on the other hand the same irritative conditions are found in total abstainers; but these, it would seem, are due to rheumatic phenomena and are often the forerunner of an approaching attack of acute articular inflammation.

Congestion and thickening of the peridental membrane and temporary loosening of the teeth, accompanied with dull, gnawing pains and more or less soreness are a common occurrence in rheumatism and gout. At times this condition is the first definite system to be manifested of an approaching attack of acute articular inflammation, while in others it does not make its appearance until after the first acute symptoms have subsided, and occasionally it is the only manifestation of this peculiar diathesis.

Chilling the surface of the body, or in other words taking cold, is usually the exciting cause of an attack, while an injudicious diet greatly aggravates it.

The presence of concretions upon the roots of the teeth is the most common cause of inflammation of the peri-cementum, and it has been generally supposed that these concretions were formed from the saliva.

It is my purpose to call attention to what seems to me to be a more rational explanation of the formation of these deposits in locations where the saliva could not, or could with great difficulty, reach. The saliva contains, as waste products, a certain amount of phosphate and carbonate of calcium which has been rendered soluble by the action of carbonic acid. A certain amount of ammonia is given off from the lungs as a product or decomposition of tissue; while

fermentation of alimentary débris lodged about the teeth also furnishes an additional amount of ammonia. This ammonia coming in contact with the saliva in the mouth, unites with a portion of the carbonic acid to form carbonate of ammonia, thus liberating a portion of the calcium which is thrown down in the form of a precipitate and lodges upon the exposed surface of the teeth. But when deposits occur at remote points from the gum-margin, it does not seem possible that this is the correct explanation of their presence in these locations. The law of gravity carries all bodies that are heavier than the medium in which they are suspended, downwards; consequently we must look for some other explanation for the presence of the deposits on the roots of the superior teeth.

Capillary attraction may possibly account for their location, but this seems hardly probable, or it presupposes the presence of a pocket, or a separation of the peri-cementum from the cementum, while the amount of saliva entering such an existing *cul-de-sac*, would be extremely small, and not likely to be changed at sufficiently frequent intervals to account for the rapid accumulation which takes place in some of these cases. We are forced, therefore, to the supposition that they are deposited from some other source, and under an entirely different group of circumstances.

It has been suggested by Dr. Ingersoll of Keokuk, Iowa, that these concretions were a direct deposition from the *liquor-sanguinis* which bathes the roots of the teeth during the suppurative stage of the inflammatory process. This may be the correct solution. It is true that calcareous material is sometimes deposited from pus, a proof of which might be mentioned the fact that the roots of teeth penetrating the antrum of Highmore and foreign bodies located in this sinus during suppurative inflammation, have been found when removed to be covered with calcareous deposits, but that this is a common occurrence in suppurative conditions in any locality, admits of serious question. I am of the opinion, however, that the deposition of the concretions upon the roots of the teeth in those localities not readily reached by the saliva, or in which the presence of the saliva would be an impossibility, is due to the causes which produce the chalky formations found in the joints and fibrous tissues of gouty and rheumatic individuals.

The thought has occurred to me, though I have not had time to demonstrate it positively, that the concretions found upon the roots of the teeth in the locations just named were masses of soda with phosphate and carbonate of calcium, and that they are deposited directly from the secretions, as is often the case in rheumatic arthritis.

Furthermore, it would seem that these concre-

tions were the cause of the inflammatory condition, rather than the result of it; in proof of this let me state that clinical observation teaches that suppuration often occurs about the roots of the teeth at remote points from the gum-margin, and which have no outlet until the peri-cementum is dissected from the roots of the teeth by the accumulation of the pus. I have seen cases in the lower jaw in which an abscess had been formed upon the roots of living teeth, between the neck and the apex, and in which the attachment of the gum at the neck of the tooth was intact and the pus did not escape until nature had perforated the soft tissue, or relief was given by the use of the knife. In such cases I have never failed to find concretions upon the root at the point of suppuration; this could not possibly have been deposited from the saliva, and it is fair to presume that the deposits upon the root was the source of irritation that produced the abscess, rather than that the inflammatory condition was produced by some remote cause and the formation of the deposit the result of the inflammation.

Dental exostosis, or hypertrophy of cement tissue, is an occasional occurrence in individuals of a gouty or rheumatic diathesis. It is most commonly found in chronic cases of long standing, and is often associated with enlargement of the joints.

The causes are in all probability the same as those which produce the enlarged joints. Chronic irritation of the periosteum tends to hypertrophy of bone; while the same condition of irritation in the peri-cementum produced hypertrophy of the cementum. The history of these cases is usually one of chronic irritability of the peri-cementum with periodical attacks of soreness and looseness of the teeth, while the cause of each attack is generally referred to some recent exposure in which the individual has taken cold. The acid reaction of the saliva and the urine at these times gives evidence of an acid condition of the blood. This would seem to indicate the cause of the irritation and suggest the line of treatment to control the immediate symptoms and the prophylaxis of the future.

Phagedenic Pericementitis is sometimes directly traceable to a rheumatic condition of the system or the uric acid diathesis. In several cases in which I have analyzed the urine, uric acid was found largely in excess of the normal quantity.

In all of the cases which I class as rheumatic, concretions are found upon the roots of the teeth, and many times in locations which preclude the possibility of a salivary origin.

Under restricted diet in which meats, wine and malt liquors are cut off, there is soon a marked diminution of the quantity of uric acid excreted, and an equally marked improvement takes place in the symptoms manifested in the

oral cavity, which cannot be accounted for by the removal of the concretions and local treatment alone. In one case which has been under observation for four years, the periodical aggravation of the oral symptoms are a sure indication of the presence of an excessive amount of uric acid in the urine, and as soon as this condition is corrected the inflammatory conditions of the peri-cementum are greatly relieved. Local treatment is necessary, but this alone is not sufficient; we must strike deeper and correct the morbid condition of the system if we hope to effect a cure.

Other cases might be cited that would seem to further substantiate the opinions already expressed, but time will not permit. I trust, however, the matter has been so presented as to stimulate farther investigation into this subject, and I believe if your observations are carefully made you will agree with me that the facts and opinions presented warrant the supposition that gout and rheumatism are important factors in the production of a considerable variety of irritative conditions of the peridental membrane.

7 Jackson Street, Chicago.

(To be concluded.)

BOOK REVIEWS.

MINOR SURGERY AND BANDAGING, including the treatment of Fractures and Dislocations, etc. By HENRY R. WHARTON, M.D. Philadelphia: Lea Bros. & Co., 1891. Chicago: A. C. McClurg & Co. 8vo, half calf, pp. 497. Price \$3.00.

The introduction of a new plan of bandaging in accordance with the teachings of antiseptic surgery has rendered many of the books on bandaging obsolete, and the present book fairly supplies the defect. It is a pleasure also to note that the writer is an American, familiar with American surgical appliances, which have too frequently been ignored in the foreign reprints with which the market has hitherto been flooded. Notwithstanding this we notice many familiar illustrations from the text books that flourished many decades ago.

In the main, the work is fairly illustrative of current minor surgery, but we suggest that in the next edition a more recent method of skin grafting be described than the old one on page 185. There are many cases in which the old Hamilton-Reverdin plan may be supplanted by the Thiersch method with advantage to the patient.

PRACTICAL INTESTINAL SURGERY. By FRED B. ROBINSON, B. S. M.D. Vol. ii, paper, pp. 206. Detroit: Geo. S. Davis. 1891. Price 25 cents.

The concluding volume of Robinson's Intestinal Surgery is a great improvement over the first volume; more care has been exercised in the proof reading, and the unfortunate lapses that we were obliged to mention, do not disfigure the volume under consideration. This volume shows careful experiments concisely set forth, with logical deductions therefrom.

There are eleven chapters, which comprise the main portion of the operative surgery of the work. Gastro-enterostomy, Gastrostomy and Resection of Intestine are here treated, and some interesting experiments on gunshot wounds of abdomen are given. At the end of the book a number of diagrams appear, illustrative of the various forms of mechanical "aids" to intestinal surgery and the different forms of suture.

In concluding the notice of the book as a whole, we have to say that the excellence of the second volume causes us to overlook the faults of the first, and to commend the volumes as a valuable contribution to the literature of the subject.

THE MICROÖRGANISMS OF THE HUMAN MOUTH. The Local and General Diseases which are caused by them. By WILLOUGHBY D. MILLER, D.D.S., M.D. Professor at the University of Berlin. With one hundred and twenty-eight illustrations, one chromolithographic and two photo-micrographic plates. Philadelphia: The S. S. White Dental Mfg. Co. 1890.

The opening chapters of this volume are occupied with studies of the morphology and biology of bacteria, their vital manifestations and the methods of conducting bacteriological investigations. The procedures in the culture of bacteria are well described and illustrated. The body of the work is given to the consideration of the rôle which pathogenic bacteria plays in the production of diseases of the mouth and teeth. The chapters upon their agency in the production of dental decay are of special interest, and as such are a valuable contribution to the literature of dental pathology. While the volume is one specially designed for those who make the study of diseases of the mouth and teeth a specialty, it may well command the attention of the general practitioner, as it very properly considers the agency of microbes developed in the mouth, in the production of various diseases of the respiratory and digestive organs. The work gives evidence of much original and valuable research and will well repay a careful study.

A PRACTICAL TREATISE ON DISEASES OF THE SKIN. By HENRY G. PIFFARD, A.M., M.D., Clinical Professor of Dermatology, University of the city of New York, etc., assisted by ROBERT M. FULLER, M.D., with fifty full page original plates and thirty-three illustrations of the text. New York: D. Appleton & Co. 1891.

The plates of this work are a distinguishing characteristic. The avoidance of the misleading effect of the ordinary chromo-lithographic illustrations is to be commended. The plates were prepared from photographs, many of which were taken by the author himself, with artificial light which he says he prefers to ordinary daylight. The result is much more than the ordinary one in the effort to represent the appearance of pathological changes in the skin, and approaches more nearly the effect secured in wax preparations in demonstrating skin disease. The method has the advantage over such preparations of affording an exact photographic illustration of a case in clinical practice, which is always more satisfactory, if well executed, because of its being known to have existed, than any preparation however skilfully executed.

The text is concise—the descriptions are good, and the work will be recognized as entirely modern. The paper and presswork are superior in character, and the book is well bound.

The effect of the combined work is such as to make the physician desire to possess it.

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SATURDAY, OCTOBER 17, 1891.

PEDIATRICS.

A correspondent writes: "In one of your re-
cent issues is found the announcement of the
Third Annual Meeting of the American Pedi-
atric Society." Permit me to ask if it does not
lack of affectation to give a name to a *National*
Medical Association, which cannot be found
either in DUNGLISON'S Medical Dictionary, or
in that of WORCESTER or WEBSTER, except, per-
haps, in the most recent edition of the latter,
which is in the possession of comparatively few
persons. Will you kindly enlighten some even
of your readers by giving definition of the word
pediatric, and much oblige one of the latter."

The word *pædiatrics*, or *pediatrics*, as it is more
frequently spelled to-day, is from the Greek,
παιδός, a boy, or child, and means dis-
eases of children, or rather, the biology of child-
hood. Even the last edition of WEBSTER does
not give this word, which is the more surprising,
as it has been in somewhat extensive use for sev-
eral years. Our correspondent should remember
that dictionaries do not lead, but follow. We are
able to say how long the word has been in use,
but certainly long enough to have found a place
in first-class dictionaries.

We are inclined to think, however, that our
correspondent's objection is not to the word pedi-
atrics, but is intended as a criticism of the pur-

poses of the society which devotes its efforts to
the special study of the diseases of children.

Such great advances in the elucidation of the
diseases of children have been made in recent
years that it is worth while to see in what way
it claims to be a specialty in medicine, and upon
what grounds these claims rest.

The first systematic treatise upon the diseases
of children appeared in Stockholm in 1753, the
work of ROSEN V. ROSENSTEIN. This work¹
went through several editions, and was trans-
lated into German, Dutch, English, French and
Italian. Later came the works of HARRIS, ARM-
STRONG and UNDERWOOD in England, and still
later that of BILLARD in France. These works
did very little more than collate the ideas then
extant on the diseases of children and form
groundwork for the advancement of the subject.
Nevertheless, even ROSENSTEIN expresses dissent
from the prevailing idea of the etiological im-
portance of "teething," and states that most of-
ten the troubles attributed to it will be found due
to other causes. It was too much to expect that
he could entirely emancipate himself from this
fetich, and so we find him giving directions for
determining when the teeth are at fault. Worms,
however, held full sway, and the longest chapter
in his book is on this subject. Sixty years ago
BILLARD quoted GUERSANT on the etiological
influence of teething, and agreed with him
completely as to its insignificance.

Like "cold" later in life, "teething" since the
days of HIPPOCRATES, has been credited with
causation of most of the diseases of infancy, and
like "cold," "teething" is being gradually pushed
into the background. At the close of the New-
port meeting of the Association, the chairman of
the section of Diseases of Children remarked
that he was delighted to say that never once
during the session had he heard of "teething"
or "worms." The ignorance which has ascribed
such importance to "teething" and "worms," has
assisted materially in maintaining the mortality
rate of infancy. Better diagnosis with corre-
spondingly better treatment, is taking the place
of "teething" and "worms." It may be truth-
fully said, that the number of cases of "teething"
and "worms" occurring in the practice of a given
physician is an exact index of his inability to

¹ Underrättelse om Barns Sjukdomar och deras Bote-Medel. (Ob-
servations on the Diseases of Children, and Their Treatment.)

diagnosticate the diseases of infancy and childhood.

We have mentioned these older writers merely to show that the special study of pediatrics is by no means new. To even hint at the later literature of this branch of medicine cannot be done with the space at our disposal, but it seems impossible to avoid mentioning the works of EVANSON and MAUNSELL, RILLIET and BARTHEZ, in France; HENOCH, GERHARDT, STEINER, and VOGEL in Germany; WEST in England; EBERLE, and MEIGS in America. The literature of the diseases of children has increased immensely in recent years. Systematic treatises, and monographs on special subjects abound. No less than five periodicals, three in Germany, one in France and one in the United States, devoted to this special subject, bear evidence of the increasing attention paid to pediatrics. Its crowning literary jewel has appeared in America, in KEATING'S Cyclopædia of the Diseases of Children, a monument to the industry of its writers, and an earnest of the work which has already been done, and of the importance of the subject. If children were little men and women there would not be a specialty of pediatrics. But they are not. They have their anatomical and physiological peculiarities, their own hygiene, their own pathology, their own diseases, their own therapeutics. Special methods of diagnosis are necessary in infancy, and the physiognomy of disease here is peculiar. Prognosis does not follow the same lines as in the adult. The great problems of nutrition here find their peculiar field, and upon their proper solution depends the welfare of the future man or woman. These grounds seem sufficient to entitle pediatrics to the position of a specialty in medicine. As a few examples illustrating these statements might be mentioned the anatomical peculiarities of the naso pharynx in the infant, particularly the small size of this space. This diminution in size makes coryza, so insignificant in the adult, often a matter of great importance to the infant, not infrequently leading indirectly to serious disturbance of nutrition. Enlargement of the bronchial glands is particularly a disease of childhood. Empyema is much commoner in children than in adults, and more insidious in its onset, frequently existing for months before detection. Rickets and allied forms of malnutrition are often overlooked in the

child until their greatest damage has been done. Many of the neuroses of malnutrition in the infant are not recognized as such. The diseases of the mouth are most frequently met in childhood, and have quite a different significance from the same diseases in the adult. The great group of diseases of the alimentary canal differ so widely from similar diseases in the adult, that their successful handling must be conducted on an entirely different basis from their treatment in adult life. The single subject of infant feeding, particularly artificial feeding, is so beset with difficulties that one might almost say that it alone is worthy of being raised to the dignity of a specialty.

Pediatrics certainly is not a specialty in the sense ordinarily employed, which gives this title to the special study of the diseases of a single organ or system. And yet like these branches of medicine, it requires special training on the part of its practitioners, and has been most advanced by those who have given their time and study to it as a specialty. It is in one sense the least narrowing of all specialties because its workers must keep always before them the future man. "The child is father to the man," was the title of the address of the President of the Children's Section, of the British Medical Association at its last meeting, and while he strove hard to deny that pediatrics is a specialty, his address belied his words, as he showed most conclusively that the proper handling of the child had much to do with the success with which the future adult should avoid or bear the diseases to which he might be exposed.

Pediatrics is the specialty which the general practitioner most needs, and yet it is painfully apparent to all that the teaching of this subject is sadly neglected in most medical schools. In but very few schools is that systematic instruction given, which is essential to the full appreciation of the subject, and even clinical instruction in this branch is often relegated to a secondary position.

NEW MUNICIPAL HOSPITAL, BOSTON.—A new cottage hospital has been planned, for the treatment of women, in Boston Harbor. It will be located on property belonging to the city of Long Island. The first ward building that will be built will be 140 feet long, with a capacity of 100 beds. The amount of the appropriation is \$50,000, with an increase expected in future years.

THE LEPER-PRIEST OF SURINAM.

The editor of the *British Medical Journal*, once commenting on the life work of Father DAMIEN of Molokai, quoted that sentiment of MERSON, which declares that "Nothing truly great was ever achieved without enthusiasm." The same sentiment is equally applicable to another, but comparatively unknown priest who is recently died in the service of a colony of forlorn lepers. Father JOHN BAKKER was truly hero of the type of DAMIEN, and like him contracted leprosy and died of it in consequence of his labors. Father BAKKER's field was near Batavia, in Dutch Guinea or Surinam. He was a redemptorist priest, a native of Amsterdam, Holland, about fifty-eight years of age. During the greater part of the last twenty years his life has been devoted to the care of lepers. The first signs of his malady appeared nine years ago, while he was living at a plantation called Lirio, a short distance from Paramaribo, the capital of the province. For the past six years he has resided in the Batavia leper-colony, with the expectation that he would die there with only a few fellow lepers around him. It is reported that he suffered greatly towards the last of his sickness, being confined to one small room, and yet maintained a cheerful and heroic aspect through all.

Concerning the field in which his best years were spent, it is said that there are not less than three thousand lepers in the country. Many of these reside at the capital city, staying in their houses during the day time, but greatly given to wandering about at night, regardless of law or sanitary precaution, and not at all amenable to discipline. The Governor, a man of enlightened views, has done much to check the spread of the disease, and is about to establish a hospital for the systematic treatment of suitable cases.

The points of parallelism between the two leper-priests, whose names appear above, and their lives of voluntarily exile, are sufficiently numerous to create in us no little surprise that so obscure has been the fame of one, while the other has engaged the attention of princes and rulers, and his fate has been narrated again and again in all its mournful but romantic details. We mistake not, Father BAKKER preceded Father DAMIEN in his departure from Europe, and is in point of fact the true pioneer in this

line of desperate missions. And, further, it would appear that he was the first one of the two who became affected with leprosy. But honor to them both—*par nobile fratrum*—they were doubtless unconscious rivals in heroism.

BLOOD-LETTING IN URÆMIC CONVULSIONS.

DR. SAMUEL WILKS, veteran physician at Guy's hospital, is reminiscent, in a recent *Lancet*, of the good old days of blood-letting. He remembers seeing too many interesting persons snatched by this agency from the brink of the grave, to be unmindful of its claims, and he attempts to find excuses for the present day and generation in its neglect of phlebotomy. Of his success with the lancet he writes the following:

"A young woman was brought into the hospital in a dying state, gasping for breath, and livid; there was a mitral bruit, engorgement of the lung with hæmoptysis, albuminous scanty urine, and dropsy. We bled her from the arm and the effect was immediate, the breathing became tranquil, lividity passed from the face, and improvement continued from that time. In cases of *uræmic convulsions* the effects of bleeding are very striking; the right heart is relieved, and poisoned blood is removed from the system. One case of this kind, indelibly fixed in my memory, is that of a dressmaker, who, I believe, is still alive. I was asked a few years ago to see this patient, who had been in convulsions all night. I found a middle-aged woman in constant convulsive movements, froth issuing from her mouth, quite comatose, and almost pulseless. The whole body was livid and the extremities cold. The doctor said she was dying, and allowed me therefore to bleed her. I took away a small wash hand basin of blood, and while yet flowing, the lividity passed off, the convulsions ceased, the body gradually became warmer. Her life was as clearly saved by the bleeding *as if I had dragged her drowning out of the water*, and this is more than I can say of drugs." With this, are other instances of the same tenor.

A UNION MEETING OF THE DISTRICT MEDICAL SOCIETIES OF NORTHERN OHIO.—A union meeting of the Northwestern, the Northern, and the North Central Ohio Medical Societies will be held at Mansfield on Thursday, Friday and Saturday, November 5th, 6th and 7th.

SOCIETY PROCEEDINGS.

American Orthopedic Association.

*Fifth Annual Session, held at Washington, D. C.,
Sept. 22, 23, 24 and 25, 1891.*

ORTHOPEDIC SURGERY AS A SPECIALTY.

DR. A. B. JUDSON, of New York, in the President's address, said that orthopedic surgery is specially the domain of physical demonstration, where subjective symptoms give place to objective signs, where treatment is chiefly mechanical, and where results are recorded in degrees of a circle and fractions of an inch. It exists and thrives as a specialty, because the general practitioner concurs with the public in committing patients who, from the nature of the case, generally recover with some deformity and disability, to the care of experts.

DR. N. M. SHAFER, of New York, defined orthopedic surgery as that department of surgery which includes the prevention, the mechanical treatment and the operative treatment of chronic or progressive deformities, for the proper treatment of which special forms of apparatus or special mechanical dressings are necessary.

DR. V. P. GIBNEY, of New York, proposed a definition as follows: That department of general surgery which includes the prevention, the mechanical treatment and the operative treatment of chronic or progressive deformities.

ORTHOPEDIC NOSOLOGY.

DR. W. R. TOWNSEND, of New York, advised the construction of a uniform nomenclature for orthopedic affections, to facilitate the taking of histories, and to increase the value of reported cases. A committee was appointed for this purpose.

THE LATE MR. THOMAS.

DR. A. J. STEELE, of St. Louis, paid a friendly tribute to the late Mr. Thomas, of Liverpool, a Corresponding Member of the Association, whose methods have been so widely discussed, and whose influence is felt in many branches of orthopedic practice.

CRURAL ASYMMETRY AND LATERAL CURVATURE.

DR. H. L. TAYLOR, of New York, described two cases in which the leg was two inches, and one and one-eighth inches short respectively. Both cases were in young women. The short limb was larger and stronger, the shortening was chiefly below the knee, and there was no lateral curvature.

DR. A. HOFFA, of Wurzburg, Germany, described a specimen which proved that in one instance the shortness was due to union of the neck and shaft of the femur at an acute instead of an oblique angle.

DR. F. BEELY, of Berlin, illustrated with specimens of lateral curvature and ingenious models, the changes which occur in the bodies of the vertebrae preceding rotation, explaining how the paraspinous sulcus is shallow and broad on the concave, and deep and narrow on the convex sides, a condition which is reversed in the lumbar region by the absence of ribs.

SPINA BIFIDA AND CLUB FEET.

DR. H. A. WILSON, of Philadelphia, related the case of a child of four years. The ordinary methods of reducing the deformity of the feet excited suppuration, which resisted treatment for six months, as long as the patient remained under observation. There were sensory paralysis and deficient circulation in the lower extremities. The same intolerance of surgical treatment thwarted all attempts to treat the spinal tumor.

DR. L. A. WEIGEL, of Rochester, had had similar trouble with a similar case, but found that when the child was older, it was possible to treat the deformity of the feet with success.

DR. A. E. HOADLEY, of Chicago, related a case of spina bifida, in which good result had followed an operation in which he did not attempt to repair the vertebral deficiency, but had simply turned up large flaps, and united them by silk sutures.

DR. T. M. L. CHRYSTIE, of New York, reported a case of congenital equino-varus, with absence of great toe and contiguous bones of the instep. Mechanical treatment speedily reduced the deformity, with a gain of symmetrical gait.

DR. W. E. WIRT, of Cleveland, related an interesting and unusual case of club-hand and club-foot, with other congenital malformations.

DR. HOFFA said it was evident that all cases of club-foot do not have the same causation. The cases reported were due to some fault in the earliest stages of development.

SPASTIC PARALYSIS AND SPINA BIFIDA.

DR. W. N. BULLARD, of Boston, reported a successful operation by Dr. C. L. Scudder, of Boston, for the relief of spastic paraplegia in a child with spina bifida. He thought the paraplegia not due directly to the spina bifida, but to the accompanying hydrocephalus. He advocated electrical treatment, and faradization rather than galvanism.

DR. WEIGEL reported a case in which division of all shortened tissues, and the use of a brace, had secured a favorable result.

DEFORMITY AFTER KNEE-JOINT EXCISION.

DR. J. C. SCHAPPS, of Brooklyn, said that after excision, the two united epiphyses make a mass of soft bone, in each end of which is inserted a long lever. With this leverage, it is possible to restore and maintain a straight limb by simple mechanical treatment.

DR. A. M. PHELPS, of New York, thought that recurrence of deformity can be prevented by liberal resection of the hamstrings.

DR. HOFFA said that relapse often occurs from incomplete removal of diseased tissue, and that when excision is done in early life, and all disease removed, marked shortening will not occur.

DR. BEELY said that flexion could be prevented by over-correction, but at the risk of further over-correction as the result of locomotion. Apparatus designed to prevent recurrence of deformity should relieve the limb from the weight of the body.

DR. TAYLOR objected to free division of the hamstrings, as these muscles are useful in balancing the pelvis on the femur, even after motion at the knee is abolished.

DR. J. D. GRIFFITH, of Kansas City, had prevented flexion by removing all the disease, and without dividing the hamstrings.

DR. SCHAPPS said that in many patients under 5 years, excision was to be preferred to mechanical treatment.

KNEE TROUBLES IN LOCOMOTION.

DR. SHAFFER related a number of cases in which an elongated patellar ligament had caused pain and difficulty in locomotion.

DR. AP M. VANCE, of Louisville, thought that the ligament might become shorter if not constantly stretched by use. Rest was indicated.

DR. GIBNEY cited a case in which rest for one and a half years had not caused shortening.

DR. SHAFFER said his patients had been benefited by giving lateral support, thus converting the joint into a true hinge.

ATROPHY IN JOINT-DISEASE.

DR. E. G. BRACKETT, of Boston, argued that atrophy is due to disease, and not entirely to reflex irritation.

DR. A. G. COOK, of Hartford, said that atrophy of the foot, often very marked, can be only the atrophy of disuse.

DR. J. K. YOUNG, of Philadelphia, believed that the atrophy in question is the result of reflex interference with nutrition. In hip disease, it appears first in the thigh muscles, especially the adductors.

ATROPHIC ELONGATION.

DR. ROSWELL PARK, of Buffalo, described the atrophic elongation conspicuous in the lower extremity. As the result of disuse from disease, with avoidance of pressure on the bone ends, the bone lengthens more rapidly than its fellow. This is illustrated in growing children with disease of the tibia or femur, and is noticeable in some cases of hip disease.

TREATMENT OF HIP DISEASE.

DR. PHELPS said that traction and fixation

should be enforced, to prevent destruction by intra-articular pressure. Ankylosis is the result, not of fixation, but of disease. The patient should be put to bed from three weeks to four months, and should then wear the lateral traction fixation splint which was exhibited. Children under 3 years are placed in the plaster of Paris portable bed, which was also shown.

DR. WIRT exhibited a new device for traction, in which the force of the lever is changed into rectilinear instead of circular motion, without key, screw-driver, wrench, buckle or strap.

DR. R. H. SAYRE, of New York, said the invention gave accurate and easy adjustment in the direction of traction, but in the direction of relaxation, the control was defective.

DR. A. J. GILLETTE, of St. Paul, was satisfied with the results obtained by the use of Thomas' splint.

DR. VANCE said he practiced fixation at the hip, but believed much depended on the surroundings of the patient.

DR. SHAFFER believed the best results can be obtained by the use of the long Taylor traction splint. He thought results should not be reported till six years had passed, as relapses were not uncommon.

DR. RIDLON, of New York, said a splint should secure immobilization by antero-posterior leverage, as in Thomas' splint, by an action identical with that of the Taylor spinal brace.

DR. STEELE approved of the combination of the English method of rest with the American plan of traction.

DR. TAYLOR practiced rest in bed with traction in the acute stage, to be followed by a splint which allows locomotion.

DR. SAYRE thought but few cases required lateral traction. When the inflammation had ceased he applied passive motion. If the pain and tenderness following last more than twenty-four hours the passive motion had not been rightly used.

DR. E. M. MOORE, of Rochester, believed that a joint only *moderately* inflamed, demands motion. He employed traction with a certain amount of motion.

CONGENITAL DISLOCATION OF THE HIP.

DR. PHELPS exhibited apparatus for the treatment of this affection, and described his method, and its results.

DR. E. H. BRADFORD, of Boston, had modified the apparatus in previous use by adding an appliance with which the patient is allowed to walk about. The joint is thus protected as in convalescence from hip disease. These appliances he had made of aluminum for the sake of lightness.

DR. C. C. FOSTER, of Cambridge, said the best recorded result had been obtained by Dr.

Buckminster Brown, whose patient was treated by mechanical means in bed.

DR. A. HOFFA had operated by deepening the acetabulum, which is practicable from the thickness of the pelvis at this point. At first, he sewed a periosteal flap over the trochanter, but this is unnecessary. Two months ago he examined his first case, two years after the operation, and found a movable joint, freedom from the characteristic gait, and absence of lordosis.

MR. HOWARD MARSH, of London, divided these cases into (1) those in which the bone slips about on the wall of the pelvis and (2) those in which it is fixed. The majority belong to the second class and in these operation is useless, but is more properly applicable to those cases of the first class in which the head is high up and movable. The anterior position is the most favorable, because lordosis, which depends on the backward displacement of the head of the femur, is absent.

DR. RIDLON said that, as subjects for treatment, anterior dislocations are more hopeless than posterior ones.

DR. DE F. WILLARD, of Philadelphia, said treatment should be by forcible attempts at reduction, to excite inflammation, followed by traction and systematic exercise.

MALIGNANT DISEASE AND POTT'S DISEASE.

DR. JUDSON reported three cases in which Pott's disease and malignant disease of the vertebræ had been confounded by himself and other observers. In one the diagnosis was made ante-mortem. The patients were four-and-a-half, thirty-five, and forty-two years respectively. The chief diagnostic points are (1) deformity present in Pott's disease, absent in malignant disease; (2) local disability; and (3) local pain, both absent in Pott's, and present in malignant disease.

DR. WILLARD had seen two cases in which his diagnosis was confirmed post-mortem.

DR. GIBNEY reported a case in a man of forty years, in which he and others had been baffled in diagnosis. There was sarcoma of the fifth and sixth cervical vertebræ.

MR. MARSH related the case of a child which was extremely difficult to diagnosticate, and which proved to be malignant in character.

SYPHILITIC POTT'S DISEASE.

DR. RIDLON said that in this form, the onset is more rapid, the pain and disability greater, the kyphosis sharper in outline, and abscesses often appear before deformity. If recognized lesions of hereditary or tertiary taint are present, treatment should be by large doses of mercury and iodide of potassium.

DR. B. LEE, of Philadelphia, referred to cases of this origin, which had come under his observation.

POTT'S DISEASE IN THE OLD.

MR. MARSH had observed instances of suppurative tuberculosis in the metacarpus, tarsus, testis, cervical glands, knee and hip in eight patients between sixty-three and seventy-three years. But senile tuberculosis of the spine is most rare. He had seen two cases. The patients were sixty-four and sixty-five years respectively. The College of Surgeons of London possessed an osseous specimen of the action of senile tuberculosis of the upper cervical vertebræ. In his "Studies of Old Case Books," Sir James Paget had recorded a case of Pott's disease in a gentleman of fifty-five, attended with angular curvature.

DR. SAYRE recalled the case of a patient, æt 55, who recovered from Pott's disease with paraplegia and abscesses.

POTT'S DISEASE AND PREGNANCY.

DR. T. H. MYERS, of New York, had collected twenty-five cases of labor in fifteen patients recovered from Pott's disease. In no instance, did caries recur. But of seven cases in which the disease developed during pregnancy, three died and three were left paraplegic. Normal parturition often follows in cases of deformed pelvis whose measurement would indicate that it was impossible. These patients should be examined by the obstetrician early in gestation.

DR. TAYLOR knew of many cured patients whose marriage had been followed by the birth of healthy children.

DR. G. W. RYAN, of Cincinnati, thought it was a question of allowing the tuberculous to marry. He knew of married women, deformed by Pott's disease, who had borne and raised healthy children.

DR. STEELE said one of his patients recovered from Pott's disease had borne six healthy children.

DR. LEE said one of his patients with a large lumbar kyphosis, had borne twelve children who with the mother, are all in good health. He thought Pott's disease, even in the lumbar region, rarely produced narrowing of the pelvis.

DR. VANCE had seen a number of cases in which this deformity had not made labor of more than average difficulty.

PARAPLEGIA IN POTT'S DISEASE.

DR. BRACKETT said that relief from paraplegia may be confidently expected from continuous extension and fixation, even in cases of eighteen months' standing. This should be continued for some time after recovery.

DR. YOUNG reported two cases of complete recovery, in which there had been absence of sensation, a feature always of grave import.

DR. SHAFFER referred to a case in which the autopsy showed that a portion of the eighth dor-

sal vertebra had nearly cut through the cord, leaving but a slender thread.

DR. HOFFA said that in these cases, the spine should be put absolutely at rest. He had collected thirteen operations within the vertebral canal. Two died at once, two recovered, and would perhaps have done so any way. In the others, there were immediate good results but relapse soon occurred. The operation has no great future before it, and should be limited to those cases in which the processes alone are affected.

DR. S. KETCH, of New York, had now under treatment a patient who had been paraplegic for five years, but he still maintained a hope of effecting a recovery.

DR. HOFFA suggested that an abscess may be exerting pressure on the cord.

DR. MARSH said paralysis rarely depends on the pressure of an abscess; but, 1, on softening of the cord, 2, pressure of a displaced sequestrum, and 3, most common, on pressure from exudation. He would only operate after thorough trial of rest.

DR. WILLARD said we could not absolutely diagnosticate the cause. When there are extensive inflammatory deposits about the arches, laminectomy may relieve the posterior pressure and allow expansion of the cord.

DR. LEE said that in all cases of this form of paraplegia, suspension would materially hasten recovery.

ABSCESSSES IN POTT'S DISEASE.

DR. TOWNSEND thought that, as a rule, these abscesses should not be opened. In some cases, aspiration should be done, and in others, the cavity should be opened and drained to prevent sepsis and danger to life. His views were based on the history of 380 patients, 75 of whom had abscesses.

DR. YOUNG suggested the division of lumbar abscesses into external and internal, according to their relation to the psoas fascia.

DR. VANCE advocated aspiration, repeated as often as fluid is detected. In this way he cures three out of five cases. The depot is thus kept small and the extent of subsequent operations, if necessary, is limited.

MR. MARSH had rarely obtained a good result by the use of the aspirator.

DR. RYAN said he had found aspiration to be a poor dependence. When interference becomes necessary, he believed incision to be the most conservative and effective procedure.

MR. MARSH said that, in his observation, it is best to open freely, evacuate thoroughly, and then apply pressure to assist in closing the cavity.

B. E. HADRA, of Galveston, said that on general surgical principles such abscesses should be evacuated.

DR. WILLARD would let dormant and caseating foci alone, liquifacting collections; he would aspirate and inject with iodoform emulsion, and if true pus were present he would incise, wash out with sublimate solution, and avoid undue manipulation, which might cause fissures which would let the tuberculous poison into the system. He would then suture the incision, and inject iodoform and boiled olive oil.

DR. BRADFORD said that, while he did not think the danger from opening large abscesses was so great as had been thought by some, he was aware that absorption of such abscesses is not at all uncommon.

DR. J. E. MOORE, of Minneapolis, said the evacuation of a spinal abscess is a matter of great surgical responsibility, as it is an aseptic cavity, difficult to protect from infection after operation.

DR. HOFFA would open only those abscesses which cause severe pain, or are likely to give rise to septicæmia.

DR. LEE would never open an abscess of this kind unless compelled to by the conditions mentioned by the last speaker.

DR. KETCH said there was danger that in our anxiety to treat a secondary feature we neglect the disease itself.

DR. SHAFFER would not say that incision was never advisable, but generally it is wrong to open one of these abscesses. A very large abscess cannot be washed out, and its disappearance may be confidently expected, especially if efficient mechanical treatment is practicable.

DR. MYERS said that it was proven, 1, that it was impossible to completely remove bacilli from the abscess cavity, and 2, that bacilli-infected wounds at times, heal primarily. Infection is more imminent after incision, because the wound lays open channels of absorption.

WIRING THE VERTEBRAL PROCESSES.

DR. HADRA suggested that the spinous processes at the seat of the disease be exposed and then firmly wired together to secure rest, and prevent deformity. The operation, as he had performed it for fracture of the cervical spine, was extremely simple and effective.

DR. SAYRE thought the wires would not bear enough force to remove the weight from the vertebral bodies, and that outside protection would be necessary to prevent lateral and rotatory disturbance.

DR. JUDSON thought it was a question whether wiring was applicable through the long periods in which consolidation is delayed. Intolerance of the skin always prevents such pressure as we would like to make on the kyphos. The method proposed, circumvents this difficulty.

DR. R. WHITMAN, of New York, said that due consideration should be given to the difference

in development between the growing and adult spine.

DR. KETCH did not see how the proposed operation could take the place of apparatus.

DR. MOORE said it was a most simple and harmless procedure and notwithstanding the theoretical objections, he would accept the first favorable occasion to try it.

PROGNOSIS AND TREATMENT OF POTT'S DISEASE.

DR. KETCH had learned from 75 cured cases, that in length of treatment and degree of deformity, the upper region of the spine is most favorable, and the middle least of all, that paraplegia more frequently accompanies disease in the upper than in the lower regions, and that cases of traumatic origin, recover sooner than those of tubercular origin. Sudden deaths sometimes occur in cervical caries from interference with respiration.

DR. B. BARTOW, of Buffalo, said that the earliest important sign in the dorsal and lumbar regions is lateral curvature, dependent on nervous tenderness. Apparatus should be constructed to oppose the rotation accompanying the lateral curvature, as well as the antero-posterior deformity. He used the plaster of Paris jacket applied to effect the above objects.

DR. FOSTER said that extension in *bed* is the best method in the acute stage. Extension should be made by light weights, the cords leading over the head and foot of the bed and attached to waist-belts, chest-belts, and head-straps.

DR. WEIGEL reported a case of cervical Pott's disease, with abscess and paraplegia, successfully treated by extension in bed.

DR. RIDLON had kept patients in bed from three to four years, and had never seen a case which was not benefited generally and locally.

DR. RYAN said recumbency was the ideal treatment, but it is in many cases impracticable. He had found split plaster jackets efficient after the acute stage.

DR. LEE said that many years ago, when the plan had fallen into entire disuse, he was the first to adopt suspension from the practice of Dr. J. K. Mitchell. The apparatus was Le Vacher's head support and jury-mast, attached to a chair or go-cart, or to a doorway swing.

DR. SAYRE said that in the cervical and upper dorsal region, a metal posterior splint, supported on the pelvis, should be used with the jury-mast, and in the lower dorsal and lumbar regions, a plaster of Paris jacket with a jury-mast. Recumbency should be practiced in the acute stage; children should be placed in the wire cuirass.

DR. KETCH had been disappointed with the plaster of Paris and jury-mast in the cervical and upper dorsal region. He commended the Taylor apparatus and chin-piece. In the lumbar region almost any supporting apparatus will secure a good result.

DR. TAYLOR said that the antero-posterior lever secures rest and protection, and combats deformity. Old and neglected cases are especially amenable to treatment, as ankylosis is later and rarer than is generally supposed. Abscesses and paraplegia do not forbid a favorable prognosis.

DR. BRADFORD said that the plaster of Paris jacket was the readiest method, but had its disadvantages, that a steel brace gave better support, but demanded more skill and care, and that recumbency was the surest way to prevent deformity, but, as a rule, was impracticable for the long periods covered by the disease.

TYPHOID SPINE.

DR. GIBNEY reported an additional case of typhoid spine, in a man of 45 years, in which, different from the cases previously reported, there was marked deformity in the cervical region, dating back to typhoid fever at the age of 22. Two years of pain and disability had immediately succeeded the typhoid attack. Usually, the symptoms had not appeared till one or two months after the fever.

DR. HADRA recalled an epidemic of typhoid with so much tenderness on pressure of the vertebræ, that the affection was at first thought to be meningitis.

RHEUMATIC SPONDYLITIS.

DR. RYAN said that this rare affection should not be confounded with rheumatoid arthritis of the spine. It is usually accompanied by rheumatic manifestations elsewhere. In the early stage, the symptoms resemble those of tubercular spondylitis. Later, the deformity is not angular, but resembles that of senile kyphosis. Treatment should be directed to the relief of pain by support, cautery and medication. In the chronic form, when pain has lessened, mobility should be encouraged by passive motion.

DR. HOADLEY deplored the confusion which is found in the nomenclature of these conditions which produce such a variety of results. He thought both rheumatism and osteo-arthritis were microbic diseases. If ligamentous structures interfere with motion, passive motion was proper.

DR. LEE was reminded of a case which was at first thought to be spinal myalgia, but which proved to be gouty disease of the cartilages, an infrequent affection. Apparatus afforded relief, but of course not a cure.

DR. RYAN said that gouty spondylitis is generally attended by manifestations in other parts of the body. He had failed to state that his patient had limited respiratory movements.

DR. VANCE related a case in which there was, in addition to the spinal affection, complete immobilization of the thorax, with chiefly diaphragmatic respiration.

DR. BARTOW had seen a case in which relief was afforded by the spinal jacket.

DR. GILLETTE reported a case which, at the first glance, resembled the deformity of Pott's disease, but which proved to be rachitic in its etiology. Improvement followed a few days after suspension was begun.

TORTICOLLIS.

DR. WHITMAN inferred, from the study of 264 cases, that torticollis was more frequent in females than in males, and that the two sides of the neck were equally liable. Acquired torticollis, being often the result of suppurating cervical glands, should be treated at first by mechanical support to secure rest and prevent deformity. Later, division of contracted parts, with careful after-treatment, should be practiced.

DR. HOFFA said that cases of foetal origin have immediately after birth an atrophy of the face and head.

DR. WHITMAN thought that the asymmetry of the face and head was a late feature of torticollis due to muscular action on the growing bones.

SACRO ILIAC DISEASES.

DR. LEE said the sequence of events is as follows: 1. Injury of the synchondrosis. 2. Subacute inflammation. 3. Irritation of the nerves of the joint, transmitted to the nearest plexus. 4. Resulting pain in the sciatic. The sciatica should be considered the result, not the cause, of all the trouble. In nine cases out of ten, neuralgia is the effect and not the cause of any trouble. As stooping in sacro-iliac diseases is injurious, he had devised a handy instrument with which the patient can pick up an object from the floor while remaining erect.

ELECTION OF OFFICERS.

DR. BENJAMIN LEE, of Philadelphia, was elected President, and DR. JOHN RIDLON, of New York, Secretary, for the ensuing year.

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

In the official report of Drs. C. F. MacDonald and Samuel S. Ward, the physicians appointed to supervise the four electrical executions at Sing Sing Prison in July last, which has just been made public by the Superintendent of State Prisons, many points of interest are to be found. In the killing of Slocum, the first man executed, a pressure of 1,458 volts, through electrodes in contact with forehead, temples and left leg, was applied continuously for twenty-seven seconds. When the current was broken, an examination showed that the pulse was beating strongly, and one or two minutes later, a noisy and regular respiration was established. The same

pressure was again applied for twenty-six and one-fourth seconds, at the end of which time life was completely extinct.

In the case of the next man executed, Smiler, a pressure of 1,485 volts was applied three times for periods of ten seconds, with brief intervals intervening, and between each of the three periods the electrodes were freshly moistened. At the end of the third application, the pulse was found to be beating so firmly and strongly that, although no effort was made at respiration, the circuit was again closed for nineteen seconds, when the man was declared dead. In the case of the third man, Wood, three contacts of twenty seconds each were made, and an examination then showed that respiration had permanently ceased, while no pulsation could be felt at the wrist, and no heart beat could be detected on auscultation. An extremely fine, faint crepitation could be heard, but nothing else. As in the preceding instance, the pressure was 1,485 volts. In the case of Jugiro, the fourth man, a like pressure was applied three times for fifteen seconds, with intermissions of twenty seconds each. When the current was finally broken, a very slight fluttering could be felt at the wrist. Extreme heat was noted in the region of the knee, just above the point where the lower electrode had been applied, and a thermometer held against the skin for only fifteen seconds ran up to 115°, while the sensation conveyed to the hand was such as to render it probable that the temperature had reached, if not exceeded, the boiling point of water. Within fifteen minutes after the withdrawal of the current the chest was bared, and the cessation of the heart-beats confirmed.

As in the brief report to the warden of Sing Sing Prison, published shortly after the execution, the physicians express their positive conviction that unconsciousness was instantaneous and continuous from the first moment of contact in each instance. In order, however, to ensure that death supervene as speedily as possible, they think it is necessary to continue a current of the voltage employed in these cases for from fifty to sixty seconds. In each case the temperature of the water near to, and at the edges of the electrodes, was raised nearly, if not quite, to the boiling point, so as to blister the skin more or less extensively. There was absolutely nowhere any smoking, charring or burning.

Before going to the Medical and Surgical Congress, and after their return from Washington, Sir William and Lady MacCormac were the guests of Dr. Lewis A. Sayre here, and on Wednesday, September 30, at Dr. Sayre's hour, the distinguished London surgeon gave a clinical lecture in the amphitheatre of Bellevue Hospital, during the course of which he performed an exsection of the elbow-joint. Dr. Sayre's myriad friends throughout the country will be glad to hear that, notwithstanding the gratuitous and malicious report published a short time since in one of the morning papers, that he was hopelessly invalided and had permanently retired from practicing and teaching, he has quite recovered from his severe illness, and has once more regularly resumed his valued instructions in connection with the chair of orthopædic surgery at Bellevue.

In addition to "Laloo, the double-bodied Hindoo boy," there is at present on exhibition in this city a remarkable double-headed and double-bodied monstrosity that was with Barnum when he had his show in London, but has never been in America until now. In this instance, while there are two entirely separate heads and pairs of shoulders and upper extremities, the bodies are united for a short distance, the right and left axillæ respectively to a little above the hips, and from there down there is but the body of one person. There is complete use of the four arms, which are well developed, but the legs are not sufficiently strong to bear the weight of the parts alone without some additional support to supplement them. The sex is male and the two boys are said to be possessed of more than average mental capacity. Their faces are bright and intelligent, and they speak French and Italian fluently. Consciousness and sensation are entirely separate in the two, and one may be sleeping while the other is awake. Curiously enough, one lower extremity seems to belong to each boy exclusively; so that the boy on the right feels no sensation when the left leg is pinched or pricked, and the boy on the left is unconscious of any irritation applied to the right leg. These conjoined boys were born in Italy sixteen years ago, and their mother, Antonia Battista, a stout, healthy woman of 36, accompanies them here. The day of their birth was the 4th of July, and they might with propriety have been named after George Washington and Thomas Jefferson; but as their parents were probably ignorant of the significance of that glorious anniversary, they were christened simply Giovanni and Giacomo.

In connection with the St. Thomas House, with its meeting hall, school-rooms, work-rooms, library and gymnasium, the noble charity which Mr. Flower, the Democratic candidate for Governor, founded and endowed as a memorial of his son, there is a well appointed diet kitchen. This is conducted by the "Helping Hand Society," with a hired matron in special charge, and large quantities of beef tea, mutton broth, and other articles of nutriment are dispensed from it to the sick poor of the parish and the neighborhood.

It is stated that the surgeons of the New York Hospital some little time since made an unsuccessful attempt at skin grafting with the skin of frogs in a case of extensive burn. Six dozen of the finest specimens to be had in the market were selected and fed and attended with the greatest care, so as to have them in the best possible condition at the time of the operation. Some thirty grafts about the size of a twenty-five cent piece, taken from the backs of as many well fattened frogs, were used at one time, and it seemed at first that there was every prospect of success. The final result, however, was a total failure, as the grafts were not possessed of sufficient vitality for the desired purpose. Still, it is an ill wind that blows nobody any good, and for some time the house staff luxuriated on the choicest frog legs. P. B. P.

Editor of The Journal:

Dear Sir:—I beg to ask you, through THE JOURNAL, the following questions:

1. Is a regular physician, who graduated at a reputable homœopathic college and practiced the same, but has since disavowed and refuses to practice homœopathy, and applies to the American Medical Association or any auxiliary for membership, would he be eligible?

2. In the Code of Ethics of the American Medical Association, what is meant by the term "regular?"

G. M. CLOUSE,

Sec'y Central Ohio Medical Society.

1. Yes, and given all needed professional support. Any other course would smack of the intolerance and bigotry of the dark ages.

2. The term "regular," as used in the Code of Ethics of the American Medical Association, refers to one who has graduated from a reputable medical college, and in practice conforms to the methods of professional conduct enunciated by the Code of Ethics of the American Medical Association.

MISCELLANY.

THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.—The fourth annual session of the Southern Surgical and Gynecological Association will be held in the Hall of the House of Delegates, in the city of Richmond, Va., on Tuesday, Wednesday and Thursday, November 10, 11 and 12, 1891, under the Presidency of Dr. L. S. McMurtry, of Louisville. The Secretary, Dr. W. E. B. Davis, of Birmingham, Ala., is arranging a full and interesting programme, and the Chairman of the Committee of Arrangements, Dr. Hunter McGuire, of Richmond, announces that the facilities for a successful meeting are complete. This Association is essentially a working organization, and is doing a great work in the Southern States. The three volumes of Transactions already issued are highly creditable to any society or country, and have elicited the highest commendation from the medical press in this country and Europe. The meeting in Richmond promises to be the most successful the Association has held. Members of the profession generally are cordially invited to attend.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from October 3, 1891, to October 10, 1891.

Surgeon William H. Forwood, U. S. A., granted leave of absence for one month, on account of sickness.
Col. Charles T. Alexander, Chief Medical Purveyor U. S. A., relieved from duties of attending surgeon and examiner of recruits in New York City, and assigned to the charge of the medical purveying depot in that city.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending October 10, 1891.

Surgeon S. H. Dickson, ordered to Marine Bks., Washington, D. C.
Surgeon A. Magruder, detached from Marine Bks., Washington, D. C.

Surgeon N. McP. Ferebee, ordered to the U. S. S. "Atlanta."

Surgeon M. C. Drennan, detached from the U. S. S. "Atlanta."

Surgeon J. R. Tryon, ordered to the U. S. S. "Chicago."

Medical Inspector J. C. Walton, detached from the U. S. S. "Chicago," and granted six months leave.

P. A. Surgeon J. F. Keeney, from the U. S. S. "Minnesota," and to the Naval Hospital, New York.

P. A. Surgeon R. P. Craudall, from the Naval Hospital, New York, and to the Naval Laboratory.

Asst. Surgeon Robert Boyd, from the Marine Rendezvous, Boston, and to the U. S. S. "Chicago."

Asst. Surgeon A. R. Alfred, from the U. S. S. "Fern," and to the U. S. S. "Kearsarge."

Asst. Surgeon M. F. Gates, from the U. S. S. "Kearsarge," and to the U. S. S. "Fern."

Surgeon Howard E. Ames, ordered as delegate to the Public Health Association, Kansas City, Mo., October 20, 1891.

Asst. Surgeon James H. North's resignation accepted September 8, 1891.

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No. 17.

ORIGINAL ARTICLES.

AMERICAN MEDICAL ASSOCIATION.

SECTION OF ORAL AND DENTAL SURGERY.

(Concluded from page 602.)

DISCUSSION ON DR. MARSHALL'S PAPER ON THE RHEUMATIC AND GOUTY DIATHE- SIS, AS MANIFESTED IN DISEASES OF THE PERIDENTAL MEMBRANE.

Dr. Williams:—Mr. Chairman, I have a few words to say, and that is that this paper seems to me to be a very sound and rational paper in every respect. There is a point of originality in the cause of secretions which strikes me as quite new. Another point that I fully concur in is that the local treatment, whether by scraping with instruments or by application of various medicaments, will not produce the preventative action we want.

Dr. Noble:—I was very much interested in one or two points in the paper, and that was the force of this deposit that we find frequently in these deep seated troubles, and I know that we ought to seek for something besides a local cause. I was very glad to see a proof of Dr. Marshall's theory in that direction. I have not much to say because this is rather a new thought to me looking for these troubles; but I shall in the future try to observe some facts drawn out by Dr. Marshall's paper. I have not the slightest doubt but they are derived from correct observation. I think we must look to the system far more than we have looked in general treatment. It is rather in the general system than in local cases that we should look in many of the most thick and deep seated troubles. I rejoice to see a paper with the perfection with which this paper was placed before us, and shall read its publication with a great deal of interest; and try to see if the statements made by Dr. Marshall can not be verified by observation in my own practice.

Dr. Whitefield:—I would like to say a few words about a case that bears on this subject.

I have in mind a patient who came to me seven years ago with almost perfect teeth, but her gums were highly lacerated. The explanation she gave was that she used to have a desire to probe her teeth continually and thought that caused the trouble. At the time I did not understand how to treat her; but later on I found the lady was suffering from a rheumatic diathesis, and every once and awhile this would occur. As I knew her better, I now can recall that she would have this trouble about the time she would have the rheumatic trouble. She was past the middle period of life and had almost perfectly sound teeth. She was very cleanly about her teeth and I never could find a particle of tartar about her teeth. I am therefore confident that Dr. Marshall's deductions are correct.

Dr. Daniels:—I would not attempt to discuss a paper like this without some preparation. I certainly think that in all of these papers there ought to be some time allowed for criticism. I have no doubt, from the style of the paper, that Dr. Marshall has given a great deal of thought to it, and thought that will lead in the right direction and that we should learn more about the manner of investigating this very serious trouble. I would like to hear others on the same subject.

Dr. Taft:—Gentlemen, I have had a great many ideas on this subject in my time, some of which I think were good, and some of which I thought at the time were good, proved afterwards not to be very good; a variety of ideas. In reference to these particular deposits upon the root of the tooth in connection with the suppuration that takes place between the root of the tooth and its surrounding tissue in the disease of the periosteum, or tissue surrounding the cementum, it is found in various forms as you all know. Sometimes it is more dense than ordinarily. Sometimes there is a considerable amount, in thick clumps, and in some cases largely distributed over the root of the teeth. I think it is always of a darker color than ordinary salivary calculus. There are a great many varieties and it will be interesting to follow them out and the paper leading in that direction. It would be an interesting question to decide fully by induction the action of these various presentations of this trouble. The deposit is sometimes very rough

on its surface, in other instances quite smooth. However it may be in these respects, it presents a surface in which the tissue can never unite, and while it remains there will necessarily be a diseased condition. That it comes from the saliva there is no evidence whatever, as indicated in the paper. It was formerly assumed by many that it occurs in the same way that ordinary saliva calculus does; but there are so many counter-indications, that this theory can not be considered as correct; and we must look for the trouble elsewhere. I have no doubt this material is a deposit from the blood. Where this disease takes place, how this disease begins, perhaps is not so easily explained; that is, how the disease occurs in connection with this condition of affairs. As a matter of course there must be an irritant in the part before any deposit takes place; that this deposit is a primary thing in this respect I do not believe. I think it is a consequence of the diseased condition that existed before any deposit at all was formed. What the irritant or cause of this disturbance is in the first place, I will not now pretend to say; only that it is at first a point of deposit, a point upon which vicious matter is retained, that becomes more and more vicious as it remains. Dead material that comes into such a pocket or space will be more likely to be retained on this roughened surface. It occupies the place that living tissue ought to occupy, and then again where it is rough, and sometimes it is found very rough, it consists of little nodules all over the surface. Allowing the tissue to come in contact with it will create irritation. There will be irritation induced by pressure against it, and when there is a rush of blood to the part, an enlargement of the vessels in the immediate vicinity thus occurs. This sensation has been referred to by Dr. Marshall, that persons desirous of assuaging pain will do so by pressure upon the teeth, and that will give relief. By pressure it relieves the distended vessels, and then by letting up again there is a sense of relief.

Well, then, the question occurs, what shall be done; mere systematic treatment will not do. I do not believe that after this deposit has been made upon the roots of the teeth that it can be removed by systematic treatment. It is true, that if the system is in bad condition it may be improved, and whatever may be done in that respect increases the tone and strength, and often relieves the system of embarrassment of this kind; although it will not remove this particular deposit. It is sometimes confined to the end of the root and there may be very little of a pocket. Sometimes it may be found on teeth on one side, sometimes at the end; in molar teeth it is often in the bifurcation of the roots. Its frequent point of deposit in such locations renders it exceedingly difficult to remove, as this material

does not readily dissolve by solvents; that is where there is a large mass of it, it is not readily dissolved. In testing the solubility of this material in sulphuric acid it does not readily dissolve; so that what should be done with it is a question that is difficult of solution. If there is a pocket running down, it may be removed with a fine chisel-shaped scaler; but what shall be done when there is no pocket, when there is not a large space around the edge of the root. I have not long since seen superior molars removed with three well-defined roots, in which, at the bifurcation, there were large masses of this material. In a case of mine where the patient was exceedingly anxious to save the tooth, which we always try to do when we can, he had given it treatment both surgically and with applications; but the tooth had to be taken out. Upon the outside of the roots where they could be reached with a scaling instrument they were in good condition but where the surfaces were inaccessible by the instrument, sulphuric acid had been used, but with very little effect. Now a case of this kind is very difficult to manage.

Another point is, what shall be done in the way of prophylaxis, before any disease has taken place? Can any treatment be employed before other disease commences? Are there any indications, are there any symptoms in the beginning that will aid you, and for which remedial or preventive treatment may be employed? These are points to which attention ought to be given and which we ought to study as thoroughly as possible in order to attain to an effective treatment or management of such cases. When we speak of prophylaxis, I suppose we speak of management of the body in such a way as to convert or prevent disease. What can be done to prevent this, and when that is ascertained what treatment may be employed to prevent or cure this condition? I fancy that we do not sufficiently understand the beginning of diseases of the teeth, and that therefore our prophylactic treatment and suggestions with reference to prophylaxis is quite below what it ought to be, and what it ought to be for the best interest of our patients.

What light ought we to have on this subject? Dr. Whitefield:—It seems to me that the value of Dr. Marshall's paper is that it does not point out treatment except in a general way. The question we ought to know is whether persons with rheumatic diathesis are more liable to have trouble.

Dr. Marshall:—Mr. President, I purposely avoided in my paper any reference to a special method of treatment. My idea was to present a paper on the pathology of the condition; and of course, as the title of my paper indicates, I confined it to the manifestation of rheumatic and gouty diathesis as manifested in diseases of the periodontal membrane. In reply to Dr. White-

field's question I may say that I have never noticed any difference between living and dead teeth so far as the manifestations in the peridental membrane are concerned. The remarks of Dr. Taft deal very largely with the point brought out in the paper with regard to location of concretions on the teeth and their character. Dr. Noble asked a question which I do not think was fully understood; whether these concretions were found at the apex or upon the root of the teeth where there was no external opening at the margin of the gum, which proves, I think, my position. I claim such conditions exist as a result of rheumatism and gout, viz: that the concretions are not of salivary origin. The issue I make with Dr. Ingersoll is, that these deposits are not necessarily the result of suppuration, or that lime salts are deposited as the result of inflammatory conditions. I claim, on the other hand, that the concretions just referred to are the results of a rheumatic or gouty diathesis, and are deposited upon the cementum through the agency of the peri-cementum, just as concretions are deposited in the synovial membrane in rheumatic arthritis. I have never seen a case which I classify as rheumatic without finding concretions present; but phagedenic peri-cementitis is not always the result of a rheumatic or gouty diathesis. You will find a great many cases of phagedenic peri-cementitis in which the roots of the teeth are perfectly clean. To illustrate, and I mentioned this in a discussion some years ago before the American Dental Association at Minneapolis, phagedenic peri-cementitis is often the direct result of peculiar neurotic conditions of the system. I recall the first case of this character that came under my notice, a patient with accidental peri-cementitis. When the patient came into my hands I tried to find concretions upon the roots of the teeth, but could find none, and I was at a loss to explain the difficulty. I made up my mind after careful study that it was a neurotic condition, or at any rate a reflex nervous condition that affected the general health, and suspected from certain symptoms that she was suffering from some uterine displacement, so sent her to a specialist with the request that he would thoroughly examine the case. He reported that she had an anteversion of the uterus and replaced it; and in less than three months her mouth was well. All the treatment she had at my hands was an antiseptic mouth wash, and the replacement of the uterus by the specialist. I have noticed also other cases in which individuals suffering from diseased conditions of remote organs had this same condition of the teeth. Phagedenic peri-cementitis is often associated with Bright's disease and diabetes mellitis. Concretions upon the roots, however, are the most common cause that produce this condition of the peri-cementum. Dr. Taft:—What is your opinion in regard to

the presence of these secretions in inflammatory cases?

Dr. Marshall:—I claim the concretions are the cause of the inflammation; they are the result of the peculiar diathesis of the system, and not the result of the inflammatory action. We find in the synovial membranes that acid crystals are deposited there and by their presence cause irritation. We sometimes find associated with these crystals the calcium salts; and the longer the disease has been running, the more likely is it that we find this peculiar condition of the concretion, that is the presence of lime salts. I have not been able yet to demonstrate by chemical analysis whether or not the concretions upon the roots of the teeth are really made up of urate of soda and lime salts. I hope sometime to be able to make the analysis; and if I get hold of a case in which the teeth must be extracted and I am sure the disease is caused by this rheumatic diathesis, I shall submit it to the best chemist we have in Chicago with instructions to examine thoroughly and report as to its composition. That is the only way to prove the theory that I have advanced.

Dr. Whitefield: Do you not consider that there may be soreness long before actual deposition?

Dr. Marshall: That is one of the general symptoms of this rheumatic or gouty condition of the system. You will find in scores of cases that the very first symptom of rheumatic trouble presented will be soreness of the teeth. In a great many cases they do not progress beyond the stage of congestion, which simply results in soreness and thickening of the membrane; a great majority, however, of the chronic cases result in exostosis of the roots and in enlargement of the epiphyseal ends of the long bones. The cases in which there are pus pockets formed are comparatively small in comparison to those that result in periodical soreness of the teeth, with thickening of the peridental membrane.

Dr. Williams: I hope Dr. Marshall will report after he has made the experiments.

Dr. Marshall: Another point I would like to mention is that in regard to the systematic treatment. I indicated in my paper that in a great number of these cases I analyzed the urine and found that the uric acid was largely in excess. In a case of this kind, I would say to my patient you are living too high, my friend, again; you will have to cut off your wine and eat no more meat, but be a vegetarian; and just as I restricted him in these things his symptoms improved. This class of cases are just as amenable to systematic treatment as the ordinary cases of inflammation of the joints. If you take it early enough you can control the symptoms; and it was this fact, as I mentioned in my paper, which led me up to the thought which I have presented with regard to the origin of many of these affections.

Dr. Whitefield: The last point is where the value of your paper lies.

(Here Dr. Taft read his paper on the "Care of the Teeth.")

Dr. Whitefield: This is a subject that interests me very much. I have always thought that a man's position depends very much on the way he regards itself. A dentist may be what I may call a scavenger, or he may not, just as he pleases. I certainly would never do any of this kind of work. If a man comes to me with his mouth filthy, I will tell him in as delicate a manner as possible to go home and cleanse his mouth; and if this is done rightly he will not take offense. I have seen cases where the mouth is so filthy that I would not handle it under any circumstances. I will point out to them and tell them what harm they are doing their teeth by letting them get in that condition. I find in most cases that when such people come back they have their mouths in good condition; they have thought about what I said. I impress upon them this point that if they will do their part, I will do mine; otherwise I will not do their work. I charge good fees, and my patients expect to have good work done. If they follow my instructions my work will stand and will be a credit to me. I think this matter should be emphasized more than it is by every dentist.

Dr. Williams:—I am very glad that Dr. Taft read that paper, because he refers so strongly to the necessity of dental hygiene and about the frequent neglect of dental hygiene. How often do we find teeth to fail even when well filled, because the general health of the mouth is neglected. Why is it? I think I can point out part of the reason why it is. It is because a man calls himself simply a dentist and thinks that all he has to do is to attend to a particular tooth. The fact is that he ought to be qualified so as to take just as good care of the health of the mouth. We should be orists. That is the proper name for an educated practitioner. As Sir Morrell Mackenzie says, the mouth is the gate of life; we stand guard over that mouth and not simply over the posts, or whatever you call them. We take charge of the whole mouth. If we have a pride in considering ourselves orists, I think we will naturally take a higher standpoint of vigilance than is generally taken.

Dr. MacNaughton:—The university from which I have the honor of being graduated impressed this on the students, that we have the right and privilege to charge whatever we think our services are worth; one of these services is to cleanse the teeth perfectly. The perfect cleansing of the mouth of a patient often does them more good than anything we can do for them. I have frequently advised my patients to cleanse their teeth, but if they will not do it I will do it myself and think it will redound to the

credit of the profession and educate the public.

Dr. Whitefield:—I thoroughly agree with the lady. What I meant to say was that where I could induce my patients to cleanse their mouths themselves I would do so.

Dr. Taft:—The conservation of the health of the mouth is a great matter; the preservation of it in the best possible condition to resist diseases of the tissue of the mouth. The mouth is the territory of the orist; it is the territory which is committed to his care, and he must do whatever he can to promote its best interests and he ought to be able to know and understand the condition and whatever is necessary to improve them. It is vastly better to preserve teeth and the mouth in a condition of health, usefulness and comfort, than it is to restore them after the incursions of diseases; and this is just the point I make, that this matter is overlooked. You will often treat a tooth to secure a good condition for life perhaps, whereas if neglected ruin would ensue so far as the tooth is concerned. It is to arouse attention to this subject that I have prepared this paper.

Dr. Williams then gave a brief epitome of his paper, "Remarks on Incipient Necrosis and Caries;" there not being time to read it, after which the session was adjourned sine die.

PHARMACOPŒIAL NOMENCLATURE, AND THE LATIN OF PRESCRIPTIONS.

Read before the Section of Materia Medica and Pharmacy, at the Forty-second Annual Meeting of the American Medical Association, Washington, D. C., May 1, 1891.

BY PROF. JOS. P. REMINGTON, PH.M.,
OF PHILADELPHIA, PA.

The frequent recurrence in current secular literature, and in halls of legislation, of the agitation against the use of Latin in prescribing and designating medicinal substances has developed a need for a strong expression of the well known advantages of the use of the Latin language in nomenclature.

The pharmacist, because of his familiarity with the methods employed by many physicians, and on account of the large number of prescriptions which annually come under his critical observation, has by far the best opportunity for forming an accurate opinion of the relative value of the methods used in writing prescriptions, and the consensus of opinion is vastly in favor of retaining Latin.

By far the larger number of prescriptions which are now compounded in the United States are written in Latin, but occasionally it will be found that a physician has formed the habit of writing in the vernacular.

The general acceptance by the medical and pharmaceutical professions of the nomenclature

of the Pharmacopœia during the last half century, has had much to do with the improvement noticed in the language of prescriptions, and although it is common to hear unfavorable criticisms as soon as a new Pharmacopœia is issued, about the inconvenience of alteration in nomenclature, especially when well established names have been changed; yet when improvements are made that must upon second thought be universally acknowledged as such, and particularly when the revisions which are carried out recognize the cardinal principles of simplicity, uniformity and accuracy, then, and then only, can the changes be cheerfully welcomed.

The first Pharmacopœia, published in 1820, presents some curious illustrations of defective nomenclature; for instance, the name aqua potassæ was applied, in the same book, to two official preparations, one aqua potassæ on page 82, made by dissolving one ounce of bicarbonate of potassium in a gallon of water and saturating the solution with carbonic acid; the other, on page 88, corresponded with our present liquor potassæ, and was a caustic solution sixteen times stronger than the other aqua potassæ.

The various committees of revision which have been appointed at every decade since then, have successfully wrestled with the subject of the nomenclature, advances being made at each revision, but not without sturdy protests and often severe denunciation for "introducing innovations" from those who believe that the use of a bad name "once established" is to be preferred to the use of a correct name, if such involves a change.

But the committee have never been wanting in the necessary courage to make such revisions in the nomenclature as they believed were warranted at the time; they have, however, always stopped short of what they considered their ideal in deference to a wise conservatism which realized fully that the names of widely known and largely used medicines should not be changed without just cause.

The greatest number of alterations in the various revisions have been made in the names of the chemical substances in the 1870 Pharmacopœia; this was due of course to the upheaval in chemical nomenclature which occurred at that time.

The committee of 1850, however, chose to ignore the controversies of the chemists in the case of two very important substances, calomel and corrosive sublimate; it may be remembered that the equivalent of mercury, as it was then called, was variously stated by chemists as 100 and 200; this gave rise to serious differences in nomenclature. If 200 was regarded as the proper equivalent, then corrosive sublimate became the bichloride of mercury, and calomel would be the monochloride or proto-chloride of mercury; whilst, if 100 was regarded as the correct equivalent, cor-

rosive sublimate must be considered to be the chloride of mercury, whilst calomel would be the di-chloride, or sub-chloride.

It will then be seen that whenever a physician ordered chloride of mercury in prescriptions, the apothecary was always put to the necessity of guessing whether calomel or corrosive sublimate was wanted; this embarrassing and often dangerous situation in nomenclature was satisfactorily cured by the committee of 1850, who adopted names for the mercurials in which the distinctions were based upon their physical properties rather than their chemical composition, and the official name for calomel became hydrargyri chloridum mite, and that for corrosive sublimate, hydrargyri chloridum corrosivum; in the case of the iodides of mercury the difficulty was overcome by Latinizing the colors of the two salts, and hydrargyri proto iodidum became hydrargyri iodidum viride, and hydrargyri deuto-iodidum was changed to hydrargyri iodidum rubrum.

These names have now become established, and they are not likely to be changed in one generation.

Old physicians will continue to use these ancient names, and it frequently becomes a question of serious importance to the pharmacist to know when hydrargyri chlor. is directed, just what to dispense; this is particularly difficult to judge at the present time, when the doses of calomel seem to be growing infinitesimal, and the former wholesome fear of corrosive sublimate seems to be greatly disappearing in the light of its extensive employment.

The various colleges of medicine are of course doing excellent service in teaching students the pharmacopœial nomenclature, and each succeeding generation of physicians will largely use the improved forms, but a careful inspection of an active prescription file will show that a large number of antiquated terms are still in common use.

The marvelous growth in the number of substances introduced into the materia medica during the last decade, particularly in synthetic products which possess antipyretic or sedative properties, and the astonishing progress made in developing chemical industries devoted to the manufacture of special products of more or less value, has had a curious effect upon the system of nomenclature which is now generally accepted; of course it has long been established as an axiom that the chemical name of a substance should accurately define its constituents, and in simple or binary compounds this rule meets with no obstacles; the fact that the substance known officially as ferri iodidum, iodide of iron, or its synonym ferris iodide, is composed of certain proportions of iron and iodine, is an illustration of the beautiful simplicity of the method which every tyro in chemistry is perfectly familiar with; but when

it is recognized that the treatment of disease cannot be cribbed and confined by the use of such easily named and readily understood remedies, and that now such ponderous looking compounds as Diethylsulphondimethylmethane, acetophenone, phenylacetamide, para-acetphenetidine, phenylhydrazinelevulinic acid, phenyldimethylpyrazolon, therahydroparaquinanisol, methylterhydro-oxyquinoline, carbonate of sodium, are in common use for the simple operations of lowering the temperature, diminishing the frequency of the pulse, or inducing sleep.

It is true that the manufacturer soon recognized the practical difficulties in the way of prescribing such remedies by their correct chemical names, and that it was easier for a physician to write instead sulphonal, hypnone, antifebrine, phenacetine, antipyrine, antithermine, thalline, thermifugin; and then again it was *easier* to obtain a copyright for an original name devised for the purpose, and thus the monopoly for its manufacture could be securely protected.

It is unfortunate that some simple yet descriptive nomenclature cannot be devised for this class of complex substances which are now so largely employed.

It is, however, in the naming of plants and vegetable drugs that the present official system is seen to the best advantage, and the value of such simple names as opium, buchu, calumba, etc., is enhanced by the simplicity of the titles of preparations made from them as tinctura opii, extractum buchu fluidum, infusum calumbæ, etc.

In those instances which sometimes occur, where two or three plants are indiscriminately used under one name, the pharmacopœia, by its description, carefully designates the plants which may be used. For an illustration, the case of rubus may be cited, which is described as "the bark of the root of rubus villosus, rubus canadensis and rubus trivialis," thus showing that the root from either or all of these plants may be employed; but for lobelia but one lobelia is recognized, *i. e.*, lobelia inflata, the species syphilitica and cardinalis not being accepted as of equal value; and it is in connection with the vegetable drugs that the merit of a well-defined and carefully considered system of Latin nomenclature is conspicuous.

The Latin name of the plant is almost always well established by botanists, and is not liable to change. Of course, plants which are of comparatively recent discovery may be attributed to incorrect sources, and subsequent revision is needed; but what shall be said about the common English names of plants, and what dire results would flow from the practice of prescribing through the use of these names.

A few years ago an editorial appeared in an influential daily newspaper, stating that the Legislature of the State of Pennsylvania would be

asked to pass an act requiring physicians, and all other persons engaged in prescribing medicines or drugs for the sick, to write the names, quantities and designations of the same plainly, in the English language and without abbreviations, and that all druggists, vendors, or compounders of drugs, medicines or herbs for the use of the sick, shall be required to label or print the names thereof conspicuously on the outside of the bottles, pots or packages containing the same, in the English language and without abbreviations.

Since this act was framed, in a number of other States, similar legislation has been sought, and the arguments used by the worthy editor of the newspaper so clearly present the views of those who sincerely believe in such legislation, that a few extracts are inserted:

"The intent of the proposed act is to prevent the poisoning of people by the blundering clerks of druggists. Any reform which will tend to reduce the chances of error deserves commendation, and especially so if it is a reform that is proposed in conformity with the requirements of common sense. There is no considerable reason why an *American* physician, who wishes to order medicines from an American drug store, should express his wish in mutilated fragments of a dead language. The drug clerk can understand his own language much more easily than he can interpret Latin abbreviations. Only one excuse for the retention of the dog-Latin prescription can be imagined, and that is an excuse which neither physicians nor druggists are likely to present. It is that doctors sometimes do not care to have their patients know what medicines have been prescribed. One of the first natural rights of a human being, however, is to know what is the name of a substance that is put into his own body; and he has the right to know what medicines he is taking, even if he is unable to comprehend their purpose and operation."

This editor was finally induced to change his views, and the act was pigeonholed, but the means by which it was accomplished did not reflect much lustre upon his heroic efforts to unselfishly serve the interests of the dear public.

To all statements that the exclusive use of the vernacular would result in disaster he turned a deaf ear. He was shown a long list of drugs the names of which were used synonymously for widely different substances, and informed that the very fact of Latin being a dead language, and thus not subject to change, and that it was understood in all civilized countries, being the universal language of science, were strong reasons for retaining its use; and all of the well-known arguments were in turn used unavailingly upon him, until at last it was pointed out, that if physicians' prescriptions were hereafter to be written exclusively in English, and if the prescriptions must be transferred to the label, so that every patient could see

exactly what he was taking, that the act, in strict justice, would also compel the printing of the *exact constituents of every patent medicine, upon their labels*; for, if it is necessary for the public protection to have the ingredients of a prescription which has been ordered by a responsible physician, to serve a special purpose, written on the label, of how much more importance does it become, to have the constituents of a secret, so-called, remedy, which is *taken by the patient without skilled advice, placed where the patient can read as he runs*, and when it was also pointed out that this would probably reduce the patent medicine business to bankruptcy, and largely diminish the advertising patronage of the manufacturers, for his newspaper, he promptly declared the act that he had so vigorously defended previously, unwise and probably unconstitutional.

Since the occurrence of the incident above mentioned, there have been several spasmodic attempts at legislation in favor of abandoning Latin in prescriptions, the last effort that the writer is acquainted with being that attempted during this last winter, in the State of Texas.

With the view of illustrating some of the dangers and annoyances that would arise, in case legislation should ever be effected, the following list of substances used under different names in different parts of the country is submitted:

Alum Root may be either *Heuchera Americana* or *Geranium Maculatum*.
 American Sanicle may be either *Heuchera Americana* or *Sanicula Marilandica*.
 American Valerian may be either *Cypripedium pubescens* or *Polemonium reptans*.
 Ash, Prickly may be either *Xanthoxylum fraxineum* or *Aralia spinosa*.
 Balm, Sweet may be either *Melissa officinalis* or *Dra-cocephalum canariense*.
 Balsam, Sweet may be either *Gnaphalium polycephalum* or *Impatiens balsamina*.
 Bay Tree may be either *Myrica cerifera* or *Laurus nobilis*.
 Bears Foot may be either *Dracontium foetidum* or *Helleborus foetidus*.
 Beech Drop may be either *Orobanche Virginiana* or *Epiphegus Americanus*.
 Bird's Nest may be either *Daucus carota* or *Monotropa uniflora*.
 Bitter Clover may be either *Sabbatia angularis* or *Centaurea Americana*.
 Bitter Wood may be either *Simaruba excelsa* or *Quassia excelsa*.
 Black Cohosh may be either *Cimicifuga racemosa* or *Macrotys racemosa*.
 Blazing Star may be either *Aletris farinosa* or *Helonias dioica* or *Liatris squarrosa*.
 Blue Cohosh may be either *Caulophyllum thalictroides* or *Leontice thalictroides*.
 Bowman's Root may be either *Gillenia trifoliata* or *Euphorbia corollata* or *Leptandria Virginica*.
 Blue Weed may be either *Lycopus Virginicus* or *Lobelia inflata*.
 Blossom may be either *Anchusa tinctoria* or *Borago officinalis*.
 Cotton Snakeroot may be either *Liatris spicata* or *Eryngium aquaticum*.
 Cancer Root may be either *Epiphegus Americanus* or

Orobanche Virginiana. *Phytolacca decandra*.
 Catch Fly may be either *Apocynum androsaemifolium* or *Silene Virginica*.
 Checker Berry may be either *Gaultheria procumbens* or *Mitchella repens*.
 Clover, King's may be either *Melissa officinalis* or *Melilotus alba*.
 Colic Root may be either *Dioscorea villosa* or *Asclepias tuberosa*, or *Aletris farinosa*, or *Helonias dioica*, or *Liatris spicata*.
 Collard may be either *Dracontium foetidum* or *Symplocarpus foetidus*.
 Coltsfoot may be either *Tussilago farfara* or *Asarum canadense*.
 Corn Snakeroot may be either *Eryngium aquaticum* or *Liatris spicata*.
 Cure-all may be either *Geum Virginianum* or *Melissa officinalis*.
 Eye Bright may be either *Lobelia inflata* or *Euphorbia ipecacuanha*.
 Five Fingers may be either *Potentilla canadensis* or *Panax quinquefolia*.
 Golden Seal may be either *Hydrastis canadensis* or *Frasera verticillata*.
 Gravel Plant may be either *Epigaea repens* or *Galium aparine*.
 Hardhack may be either *Spiraea tomentosa* or *Collinsonia canadensis*.
 Heal-all may be either *Collinsonia canadensis* or *Prunella Pennsylvanica*.
 Horse Weed may be either *Collinsonia canadensis* or *Eriogon canadensis*.
 Indian Hemp may be either *Apocynum cannabinum* or *Cannabis indica*, or *Asclepias incarnata*.
 Indian Lettuce may be either *Frasera walteri* or *Coculus palmatus*.
 Indian Paint may be either *Sanguinaria canadensis* or *Hydrastis canadensis*.
 Ipecacuanha may be either *Cephælis ipecacuanha* or *Podophyllum peltatum*.
 Itch Weed may be either *Veratrum viride*, or *Helleborus Americana*, or *Verbascum thapsus*, or *Symplocarpus foetidus*.
 Jacob's Ladder may be either *Smilax peduncularis* or *Polemonium reptans*, or *Pulmonaria officinalis*.
 Lady's Slipper may be either *Cypripedium pubescens* or *Impatiens balsamina*, or *Variolaria faginica*, or *Valeriana officinalis*.
 Lungwort may be either *Pulmonaria officinalis* or *Variolaria faginica*.
 Masterwort may be either *Angelica atropurpureus* or *Imperatoria ostruthium*.
 Matico may be either *Piper angustifolium* or *Artanthe elongata*.
 Milk Weed may be either *Asclepias tuberosa*, *Apocynum androsaemifolium*, or *Euphorbia corollata*.
 Monkshood may be either *Aconitum napellus* or *Leontodon taraxacum*.
 Partridge Berry may be either *Gaultheria procumbens* or *Momordica balsamina*.
 Pellitory may be either *Anacyclus pyrethrum* or *Xanthoxylum fraxineum*.
 Prickly Ash may be either *Xanthoxylum fraxineum* or *Aralia spinosa*.
 Rattle Root may be either *Macrotys racemosa*, or *Cimicifuga racemosa*, or *Cicuta virosa*.
 Rattlesnake Root may be either *Goodyara pubescens*, *Nabulus alba*, *Cimicifuga racemosa*, or *Polygala senega*.
 Snake Root may be either *Cimicifuga racemosa*, *Aristolochia serpentaria*, *Eryngium aquaticum*, *Liatris spicata*, *Asarum canadensis*, *Polygala senega* or *Eupatorium aromaticum*.
 Spice Berry may be either *Gaultheria procumbens* or *Laurus benzoin*.
 Squaw Root may be either *Orobanche uniflora*, *Caulo-*

phyllum thalictroides, Cimicifuga racemosa or Macrotys racemosa.
 Squaw Weed may be either Senecio obovatus or Erigeron purpureum.
 Tetterwort may be either Chelidonium majus or Sanguinaria canadensis.
 Turmeric may be either Curcuma longa or Hydrastis canadensis.
 Water Hemlock may be either Conium maculatum or Cicuta virosa, cenanthe phellandrium.
 Wild Turnip may be either Arumtriphylum or Asarum canadense.
 Yellow Root may be either Hydrastis Canadensis, Coptis trifolia or Xanthorrhiza apiifolia.
 Yellow Wood may be either Xanthoxylum fraxineum or Aralia spinosa.

Recently, Prof. E. M. Holmes, Curator of the Pharmaceutical Society of Great Britain, has collected some facts in connection with this subject. A few instances will suffice to show that the same English name is applied to different drugs, and to those having widely different properties. The educated English pharmacist would supply for mandrake root, that form *Mandragora officinalis*, the consumer of herbs would expect to get the root of *Podophyllum peltatum*, whilst the culler of simples understands mandrake root to be the root of *Byronia dioica*.

Again, chamomile, to the English buyer, means *Anthemia nobilis*, to the German, *Matricaria chamomilla*.

The difference in names of English and American plants is shown in the following list:

ENGLISH PLANTS.
 Adder's tongue.
 Ophioglossum vulgatum.
 Black alder bark.
 Rhamnus frangula.
 Avena.
 Geum urbanum.
 Bear's foot.
 Helliborus virides.
 Birch.
 Betula glutinosa.
 Bittersweet.
 Solanum Dulcamara.
 Blackberry.
 Rubus fruticosus.
 Celandine (greater).
 Chelidonium majus.
 Centaury.
 Erythraea Centaurium.
 Clover.
 Trifolium pratense.
 White Clover.
 Trifolium repens.
 Cranesbill.
 Erodium cicutarium.
 Dwarf elder.
 Sambucus Ebulus.
 Fleabane.
 Pulicaria dysenterica, etc.
 Hemlock.
 Conium maculatum.
 Yellow jessamine.
 Jasminum fruticosum.
 Liverwort.
 Marchantia polymorpha.
 Maidenhair.
 Adiantum Capillus-veneris.
 Mandrake.
 Bryonia dioica.
 Pennyroyal.
 Mentha Pulegium.
 Ivy.
 Hedera Helix.
 Pulsatilla.
 Anemone Pulsatilla.
 Queen of the meadow.
 Spiraea Ulmaria.
 Ragweed.
 Senecio Jacobaea.

AMERICAN PLANTS.
 Adder's tongue.
 Erythronium Americanum.
 Black alder bark.
 Prinos verticillatus.
 Avena.
 Geum rivale.
 Bear's foot.
 Polymnia Uvedalia.
 Birch (or sweet birch).
 Betula lenta.
 (False) Bittersweet.
 Celastrus scandens.
 Blackberry.
 Rubus villosus.
 Celandine (wild).
 Impatiens pallida.
 Centaury (American).
 Sabbatia angularis.
 Clover (sweet).
 Melilotus officinalis.
 White clover.
 Melilotus alba.
 Cranesbill.
 Geranium maculatum.
 Dwarf elder.
 Aralia hispida.
 Fleabane.
 Erigeron canadense.
 Hemlock (Spruce).
 Abies canadensis.
 Yellow jessamine.
 Gelsemium nitidum.
 Liverwort.
 Hepatica triloba.
 Maidenhair (Canadian).
 Adiantum pedatum.
 Mandrake (American).
 Podophyllum peltatum.
 Pennyroyal (Amer.).
 Hedeoma pulegioides.
 Ivy (Amer.).
 Ampelopsis quinquefolia.
 Pulsatilla.
 A. patens, var. Nuttalliana.
 Queen of the meadow.
 Eupatorium purpureum.
 Ragweed.
 Ambrosia elatior.

ENGLISH PLANTS.
 Raspberry.
 Rubus Idæus.
 Scullcap.
 Scutellaria galericulata.
 Sloe.
 Prunus communis.
 Valerian.
 Valeriana officinalis.
 Vervain.
 Verbena officinalis.
 Water lily (white).
 Nymphaea alba.
 Water lily (yellow).
 Nuphar lutea.
 Water pepper.
 Polygonum Hydropiper.
 Wintergreen.
 Pyrola rotundifolia, etc.

AMERICAN PLANTS.
 Raspberry.
 Rubus strigosus.
 Scullcap.
 Scutellaria lateriflora.
 Sloe.
 Viburnum prunifolium.
 Valerian (Amer.).
 Cypripedium pubescens, etc.
 Vervain.
 Verbena hastata.
 Pond lily (White).
 Nymphaea odorata.
 Pond lily (yellow).
 Nuphar advena.
 Water pepper.
 Polygonum punctatum.
 Wintergreen.
 Gaultheria procumbens.

The above illustrations will probably be sufficient to illustrate the danger of resorting to English or proper names for prescriptions, although the comments on the ludicrous mistakes that often occur from the use of medicines and pharmaceutical preparations could be extended far beyond the limit of this paper.

Per contra, it may suffice to place on record the effort of a physician who succeeded in Latinizing a very familiar name, as follows:

R. Equinæherpesamarac, oj.
 Take a tablespoonful three times a day. X.

The translation is, Hos(s)tetter's Bitters.

THE PRESENT STATUS OF MATERIA MEDICA AND THERAPEUTICS.

Read before the Section of Materia Medica and Pharmacy at the Forty-second Annual Meeting of the American Medical Association, at Washington, D. C., May, 1891.

BY J. W. C. CUDDY, A.M., M.D.,

PROFESSOR OF MATERIA MEDICA AND THERAPEUTICS, BALTIMORE UNIVERSITY SCHOOL OF MEDICINE, BALTIMORE, MD.

Materia Medica and Therapeutics at present occupy an important place on the broad plane of medical science. The recent rapid growth of this department of our loved profession has been in such marked contrast with its slow development in the earlier ages that it really now excites wonder and admiration. New medicines, and new uses therefor are so prominent and so varied that it is with the greatest difficulty that any active practitioner of medicine can keep pace with them. Some of them, it is true, come up meteor-like and have but an ephemeral existence, but fortunately, many others, culled with greatest care, and evolved from the greatest scientific minds, have come to stay, and shine out as fixed stars upon the medical sky. In fact, they have now assumed such an important status that a résumé of their later growth and recent developments will certainly not be out of place in this new and important Section.

Looking back into the primary stages of medical history, and seeing the few and crude articles for internal medication upon which practitioners then depended, and then turning to the crowded shelves of our drug stores, filled with the finest preparations from our grand laborato-

ries, we can well see the advantage which we physicians now have over our fathers in the science, and congratulate ourselves that we live in so enlightened an age, and one of such great usefulness to those who require our services.

In those early days the number of drugs used were comparatively few, and their therapeutics but little understood. A few barks, a few leaves and a small number of minerals made up the medical armamentarium for the physician, while now the constituents of all the elements are at our disposal,—earth, air, and sea yielding up their richest products, which, through chemical and pharmaceutical manipulation, have become valued agents for the relief and cure of disease. Then *materia medica* was but a small department of our science. In the earlier schools it was included in the chair of Practice, and although considered an important part of the studies, it was small in comparison with others which went to make up the whole. Therapeutics was but little known, and empiricism held its sway. Thus for ages this department slumbered, until with the growth of years came the increase of medical lore. In these latter days separate and distinct chairs are established for its thorough instruction; colleges for its study alone are erected; societies are formed solely for its advancement; and magazines of the highest order are devoted entirely to its elucidation. Many of the brightest minds of this and other countries, such as Wood, Bartholow, Ringer, Biddle, Potter and others equally as eminent, have been placed at the shrine of *materia medica*, and we thank them for their devotion. And even this grand and honored American Medical Association has recently so far advanced in wisdom, as to form a separate Section “to especially consider the very important branches of *Materia Medica* and Pharmacy.”

It is strange, and, in fact, we are lost in wonder, when we contemplate how little was primarily known of medicinal agents. From almost the beginning of the world, diseases and injuries existed and were known, and yet medical substances were scarcely considered. Surgery seemed then to attract greater attention, and external applications were in more general use. Starting at the onset of its history, but little is known regarding it, except the traditional accounts of the lotions and salves which were used for the healing of the warrior's wounds. But really how could material substances be known as medicinal or curative agents, when therapeutics was an unknown and untried field? Superstition held sway all through the earlier ages, even until within a few centuries of the Christian era, when through the mighty efforts of the great philosopher of Cos, the father of medicine, there was made great advancement in the science. And yet, he, Hippocrates, knew naught of the

difference between arteries, veins and nerves, and still held to the then prevalent belief that there was a spiritual restoring essence or principle within the individual himself. Within the next five hundred years Galenical ideas were superadded to the Hippocratic, and with the knowledge then of the existence of blood, and its derangements, alteratives, or blood remedies became known. From that time on, down through the centuries medical studies dragged slowly through the mists and doubts of the ages. And even with that important epoch so dear to the literary searcher, called the Revival of Learning, medical advancement was scarcely perceptible. It is true that medical studies formed a part of the curriculum of the great seats of learning in Rome, Salerno, Alexandria and elsewhere, but yet the practice of the profession was so obscured by the mysticisms of the priesthood, and the worse craftiness of the astute empirics, that it made no marked headway. True it is, that through botanical studies, new leaves and roots were brought into prominence, and the number and usefulness of drugs increased thereby. Pharmacy was, however, but little known, and crude articles measured by the ounce, or by the handful, came as near to exactness as could be then attained. It is surely then surprising that during the Renaissance when all Europe was ablaze with literary glory—when Rome was at the zenith of her fame,—when Germany had reached the transition stage from darkness into light,—when England was alive with her brilliant literature, Shakespeare singing in poetic strains grand thoughts that will never die, the slow progress of the medical profession was so marked that it is painful to contemplate the position which it then occupied.

This illiteracy or backwardness, is evidenced by the following veritable prescription, which was written by one who had attained eminence sufficient to make him the physician to Lord Bemghley, Secretary of State to Queen Elizabeth, and for whom he wrote this prescription on the ninth day of May, in the year 1553. He described it as “a goode medicine for weakness and consumption,” and is as follows:

“Take a pig of nine days olde, and slaye him, and quarter him, and put him in a skillat, with a handfull of spearmint, and a handfull of red fennel, and a handfull of liverwort, half a handfull of red neap, and handfull of clarge, and nine dates, cleaned, picked, and pared, and a handfull of great raisins, and pick out the stones, and a quarter of an ounce of mace, and two sticks of goode cinnamon, bruised in a mortar, and distill it with a soft fire, and put it in a glass, and set it in the sun nine days, and drink nine spoonfulls of it at once when you list.”

Now contrast that with the position which we occupy to-day. Then huge quantities of animal

and vegetable matter was jumbled together with a "skillet" for a crucible and the sun for a chemical purifier, and after waiting for more than a week for his prescription, he was given enormous doses, or the talismanic "nine spoonfulls," at indefinite periods or "when you list." Now, through our knowledge of medical and chemical science, we are enabled to prescribe the purest alkaloid, or active principle, extracted from our most valued medicinal products, even to such infinitesimal doses, if their potency demand it, that we may order one-sixtieth of a grain, knowing that by the use of the Springer Torsion Balance scale we can be assured of exact measurements, while our therapeutical knowledge teaches us the duration of its action, and enables us to give it at exact intervals.

And now glancing hurriedly over the intervening period between that to which we have alluded and the present century, we can see really but very little of practical work either in medicines or their methods of administration. We very well know that later medical history is full of names, which, viewed from our distant standpoint, seem like towers of strength. Harvey, Sydenham, Locke, Boerhaave, VonHaller, Cullen, and a host of others cast their shadows down along the ages, but the present power of medicine, and the high status which it has now attained is due almost solely to the enlightenment of this age, and the unceasing labor of the men of our day and generation. By careful and unceasing experiments in materia medica and pharmacy, we have had brought to us hundreds of medicines, with myriads of combinations, and which advanced therapeutics have taught us, have undoubted affinity for individual organs and tissues of the body. Not only do we have medicines which will go directly to, and have their effect upon, the chief organs of the system, such as the liver, the lungs, the heart, the kidneys, and so forth, but patient and careful work has given us remedies which we know act directly upon the cell structure and individual constituents of those organs.

Just as true as we can peer down into the cavernous realms of the brain and with microscopic aid, see its mysterious structure, so true does materia medica hold within her grasp some medicine which will stir a diseased portion into normal working, or calm some excited fibre down to sweetest repose. Just as true as anatomists and physiologists have shown us the minute structure and intricate workings of the kidney, so true has pharmacy prepared for us some medicinal agent which will at once overcome its deflexion from its normal course. And just as true as chemistry has given us the constituents of the great life fluid, so true has Nature, from her boundless resources, poured out the remedy which will enrich her impoverished corpuscles,

and restore them to their natural number and activity, enabling them to carry sustenance to the body and save a human life.

These problems have been worked out within the memory of some one who hears me to-day. Much of it, and by far the most important, has been developed, Mr. President, during the short period of your own professional observation and labor. And although but half a century of years has yet been allotted to the writer of this article, during my lifetime, among the many valuable additions to our department of the science, anæsthetics have been brought into existence; two of the grandest medicines known as cardinals have been discovered; and that grand body of new medicines classed among the antipyretics and hypnotics have made their appearance, and proved their usefulness.

In commending these remedies, I wish to say a few words in reference to the *safety* or the *danger* of chloroform, a subject which has been argued pro and con by every surgeon of note, by all the text books of the land, by every medical journal in every country, and especially by every layman and every country newspaper which supplies a reading public of an area of half a dozen square miles. That its danger has been greatly exaggerated by some of these, and its greater usefulness thereby impeded, I think there can be no doubt. With proper subjects and in careful hands I cannot help but believe that the danger from this well-known anæsthetic is comparatively slight. Its exact percentage of fatal results can probably never be really ascertained, for every death accompanying its use is at once reported and heralded everywhere, while there are unnumbered thousands of cases where it is successfully used, and the knowledge of it never known outside of the humble domicile where it saved some useful life. What is more cheering than the grand results achieved by some of the leading operators of this and other lands? The world-renowned Nussbaum, of Munich, says that he has used it in 40,000 cases and not a death occurred in all that vast number. Dr. Hunter McGuire, the eminent surgeon of Virginia, reports 28,000 administrations, without a single death. Prof. Chisholm, the well-known oculist of my own city, informs me that he has used it in over 15,000 cases, in both military and civil practice, without one unfavorable termination. In my own experience of twenty-eight years of active practice, a part of which was spent in military life, where administrations of chloroform were of almost daily occurrence, I have never yet seen a fatal result, and have seen but two cases where even any alarming symptoms were manifested. Therefore, so valuable an agent as this should not be thrust aside because at some time it has been used without satisfactory results. Deaths have resulted from the powerful aconite,

the gentle opiate and the glistening steel, but we do not condemn them and cease their use. Then let us continue the use of this agent whenever demanded, but always judiciously and cautiously, for if by its administration we can avert a fatal shock to some maimed and unfortunate fellow-citizen; if through its soothing power we can check the deadly spasm in some sweet babe; if by its timely and proper use we may assuage the indescribable pains of some female as she emerges from the dread agony of labor into the sweet joys of maternity; or if to any poor sufferer with his years of pain we may give one moment of relief, we will not have used it in vain.

The two great cardiants,—one a depressant, and the other a stimulant,—to which I alluded, are veratrum and strophanthus. I speak especially concerning the first named because a celebrated writer, in his much-lauded text book, says that "veratrum viride is now very little used, hence it is probable that the accounts of its usefulness were very much overdrawn." Now this is not in accord with my judgment and experience. My faith in veratrum has borne the test of twenty-five years, and so thoroughly am I imbued with the idea of its usefulness as a cardiac depressant, that in diseases which call for that class of medicines, I regard it as my sheet anchor. In pneumonia and pleurisy it is the one bright star in the firmament of medicine; and if we are to judge the successes of the future by those of the past, it will live as long as diseases will continue to exist and medicines continue to be demanded.

Regarding strophanthus, while its action upon the system is so nearly identical with digitalis, it is more speedy in its action, and more adapted to heart failure and sudden collapse. Among the scores of cases in which I have used it, I call to mind one in which dissolution seemed almost inevitable. A prominent merchant of Baltimore was so afflicted with cardiac debility that at one of my visits I found him with a pulse of 47, and his respiration reduced to 12 per minute. By a persistent use of the tincture of strophanthus he was quickly relieved, and with its continued use alone he was restored to health. His recovery is so far, at least, complete, that he contemplates a tour abroad within the next few weeks, with a journey on foot through Scotland and Ireland. Also with a lady over seventy years of age, with diabetes and heart complications, I found its effects almost marvelous. This new African product is surely a valuable addition to materia medica.

Among the newer remedies there are several whose chemical names are long and almost unpronounceable, but whose common names are already familiar to the laity, the introduction and use of which has made a bright page on the chemical, pharmaceutical, and therapeutical lit-

erature of these latter days. Their great prominence and marked usefulness have made them familiar to every one, and antipyrin, acetanilide, phenacetin, and antikamnia are articles of daily prescription by nearly every physician in the land. I must, however, from personal experience, award the meed of praise to sulphonal, that grand quieting agent, which without any appreciable bad results, will on all occasions bring about that perfect rest which every one requires; that remedy which gently soothes to sweetest slumber the almost heart-broken babe; which calms and stills to rest the tired and worried brain of the ambitious merchant or professional man; and which drives away, for the time, all care and sorrow from the aged and infirm.

In conclusion, if in my research and my own personal experience, I have proved the salutary influence of some of these grand remedies, and shown the present exalted status of materia medica and therapeutics which this paper is intended to prove, or have said aught that will have a tendency to further elevate our profession, or relieve a sufferer, my purpose has been accomplished. And if, in its preparation, I have advanced a single thought which has won the commendation of some physician here, or if in its rendition I have uttered a single sentence which has fallen acceptably upon the ear of any one present, I am perfectly content.

THE WORKING BULLETIN SYSTEM, NATIONAL PHARMACOLOGICAL ASSOCIATION, NATIONAL LABORATORY,
AND A PROPOSED INVESTIGATION OF THE MATERIA MEDICA OF THE WORLD UNDER THE AUSPICES OF THE GOVERNMENT OF THE UNITED STATES.

Read in the Section of Materia Medica and Pharmacy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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Materia medica is the name given to the collection of substances used in medicine; Pharmacy is the science of preparing medicine; Therapeutics is the science of applying medicine to the curing of disease. These branches, related and mutually dependent, are classified under the general head Pharmacology, or the science of drugs.

"Science professes to teach what is already known or may be learned in the forms of exact observation, precise definition, fixed terminology, classified arrangement and rational explanation." This science, therefore, embraces in classified forms Materia Medica, or the substance employed in medicine; Pharmacy, or the preparation of medicine; and Therapeutics, or the application of medicine to the cure of disease.

Art is the application of science to practical purposes.

Physicians practice the art of therapeutics, or, in other words, put in practical application the knowledge of applying medicine. Pharmacists practice the art of pharmacy, or, in other words, put in practical application the science of preparing medicine. Both in their respective fields, therefore, are practicing arts of medical science.

Physicians and pharmacists are mutually dependent, for medicine cannot be applied until it is prepared, neither is there any use for preparing it except it may be applied.

The practice of therapeutics should be confined to those who are educated in the knowledge of disease and its treatment; and the practice of pharmacy should be limited to those educated in the nature of drugs and their preparations.

The practice of the professions of medicine and pharmacy is being diverted from its legitimate channel and is undergoing rapid absorption by commercial houses. The competition between these houses and the professions is disastrous, because, while the former is permitted to use various well-known business methods to bring themselves into contact with the public, and create a demand for their commodities, the latter, and especially the medical profession, is forbidden to take advantage of these methods. It is, therefore, a competition of capital and business ability on the one side, and on the other, the more exact methods of science in the hands of professional men whose entire service must of necessity be limited to a very different field. The trade in medicines has the most powerful of all methods at its command, viz.: advertising. The medical profession is denied this method of creating a demand. Furthermore, the advertising system is purposely misleading, and claims are made in regard to the curative nature of drugs entirely unwarranted by facts; but the medical profession, standing faithfully on the side of truth, does not possess an equal chance of financial success. Barnum has truly said that the public prefers to be humbugged, and medical humbuggery is such a money-making business in this country that the professions of medicine and pharmacy stand a poor show in competition with it.

The purpose of my paper is to consider some of the methods whereby the practice of pharmacy and medicine may be returned to their legitimate channels.

First, the commercial prestige of these so-called great patent medicine houses is due in a great measure to what is known as the Proprietary Medicine System. By this system they are enabled to create lasting and secret, or semi-secret, medical monopolies, become immensely wealthy, and exert the most powerful influence over all medical legislation. Medicinal prepara-

tions are put on the market with a large margin of profit, which enables the manufacturers to create an immense demand by misleading advertisements. As they do not fear competition, it is comparatively safe to sink a hundred thousand dollars in marketing one of these articles, for the return is a large one in the long run, and the market once gained, can be held indefinitely against all newcomers. I am aware of one instance where a medicinal preparation of the kind was placed on the market at \$90 a gross, and cost only \$12 a gross to manufacture it. The enormous profit of \$78 a gross on a business that figured up into the millions permitted the manufacturer to expend an enormous amount of money in advertising. The original formula was that of a weak infusion, and taken from Gross's Surgery, and the article was advertised as a "Highly Concentrated Compound Fluid Extract."

The first thing to put out of the way, therefore, in adopting any method of reform, is the proprietary medicine scheme. Instead of endeavoring to do this, however, the medical profession during the last fifteen years has made the system comparatively respectable by adopting a large number of so-called copyrighted and trademarked pharmaceuticals and new chemical preparations.

The Code of Ethics of the American Medical Association clearly condemns the prescribing of medicines which are restrained from general use by any or all of these methods of monopoly. At the same time, while this is true, a large number of the members of the Association have so far forgotten their obligations that they use the articles referred to very extensively in practice. This situation of affairs is very demoralizing, both to the profession and to the public; and the prescribing of such preparations is an act of great injustice to the pharmaceutical profession of this country, because it forces the apothecary into all manner of irregularities, so-called, to obtain a livelihood.

But there are even greater reasons why the medical profession should seriously consider the present tendency of the times in this department of medicine, for the proprietary medicine system is a continual menace to medical science and practice.

In the first place, there is entirely too much misunderstanding in the minds of medical men in regard to the nature of the patent privilege. The Constitution of the United States gives Congress the power to promote progress in science and useful arts, by securing the authors and inventors, for limited times, the exclusive use of their respective writings and discoveries. On this provision of the Constitution is founded our patent and copyright laws, but not our trademark laws. A copyright secures to authors for limited times the exclusive use of their writings,

while the patent law secures to inventors for limited times the exclusive use of their inventions. The copyright and the patent are precisely the same thing, only one applies to authors, and the other to inventors.

A trade-mark, however, as applied to the arts, is merely a commercial signature to distinguish the goods manufactured by one man from those manufactured by another; in other words, it is employed to distinguish one brand from another brand of the same article of commerce. But suppose for a moment each art to be a monopoly, of what possible use would be the trade-mark? An invention of course must be provided with a name by which it may be recognized and dealt in. By the proprietary method this name is registered as a trade-mark, and a monopoly is secured perpetual in character. Rights are thus obtained of a nature far more restrictive than those permitted by the patent. Where does the authority come from which permits inventors to thus secure for an unlimited time the exclusive use of their inventions?

It certainly does not come from the patent law.

A patent is a contract between the inventor and the government, representing the public at large, by the terms of which the inventor is granted the exclusive use of his invention for a limited time in exchange for the publication of a full knowledge thereof, whereby the public may manufacture the invention when the patent expires. Where does the authority come from which defeats the very end for which the patent law was devised?

At least one learned judge has said: "When an article is made that was theretofore unknown, it must be christened with a name by which it can be recognized and dealt in, and the name thus given it becomes public property, and all who deal in the article have a right to designate it by the name by which alone it is recognizable."

About a year ago I read a paper before the House Committee on Patents of the United States Congress, taking the same view of the case; and while the committee said that it could not constitute itself as an interpreter of the law, it was the sense of those present, that no such monopoly was ever contemplated by the trade-mark law. In a subsequent conversation with His Excellency, Mr. Benjamin Harrison, President of the United States, he said that the Supreme Court was the supreme interpreter of the law; and, on a point where there was so much dispute, a test case would probably have to be presented to it before the matter could be finally settled.

But a very similar point was long ago settled by the Supreme Court in relation to copyright, and I do not see why the decision does not apply with equal force to the subject under consideration. "In 1834 was contested in the Supreme

Court of the United States the same question which had been so elaborately argued in the English case of *Millar vs. Taylor*, decided by the Court of King's Bench in 1769, and finally settled by the House of Lords five years later, in *Donaldson vs. Becket*, viz.: whether copyright in published works exists by the common law, and is therefore of unlimited duration, or is created by and wholly governed by statute. The Supreme Court, following the authority of the House of Lords, held that there was no copyright after publication, except for the limited time given by the statute."

It has been advocated that the same articles be introduced under new names, but this is objectionable, because the old names have already secured recognition in scientific literature to a greater or less extent; and confusion would result if such a plan is adopted. This is especially true if the suggestion once made should be put in force, whereby each manufacturer should have a trade mark name for the same article. Imagine the load of synonyms that would accumulate in a few hundred years. Furthermore, the public has a perfect right to manufacture any article that is not patented, and not until the new name thus introduced becomes equally known to the public, has another manufacturer an equal chance with the inventor to manufacture an article to which he has an equal right. Finally, there is a right way and a wrong way for the medical profession to look at this question of trade mark names which is so seriously injuring medical nomenclature. For the profession to adopt the wrong way, or dodge the issue, is not only to show cowardice, but to tacitly endorse or sanction the unscientific scheme of the proprietary trade.

Next, I wish to present to your consideration this point: While there may not be any apparent difference between the practice of a professional man and a tradesman, the true difference is plain enough when motives are considered. A tradesman practices his vocation for the sole purpose of making money. If he takes any interest whatever in scientific matters, or in the good of his fellow-tradesman, this is incidental. A professional man, on the contrary, is actuated by a very different motive. He practices his vocation to benefit science, elevate his profession, and serve the cause of suffering humanity; and money making is incidental. It is the faith of the public in the altruistic nature of medical practice that gives confidence under the many trying circumstances attending sickness and death. What person would call in a physician whose reputation was that of one who practices medicine with the primary object of money making? Such a man's services would be rendered in proportion to the pay. The poor have just as good right to the very best services of the best physicians as

the rich, and this principle is recognized everywhere.

Again, the standing of a commercial house is founded upon its business prestige; but the standing of a physician is founded upon the value of his services to medical science, to his profession, and to the cause of suffering humanity.

Now I claim that pharmacy, being a branch of medical science and art, should be practiced as a profession, not as a trade; and the standing of a pharmacist should be founded, not on his commercial success, but on his contributions to medical science, and the value of his services to the profession and to the public.

If the line were drawn by the medical profession between pharmacy as a profession and pharmacy as a trade, there are plenty who would step over this line to the side of scientific medicine; and the class of pharmacists and manufacturing houses thus created could be trusted to take care of the scientific and professional interests of this important department of medicine.

For more than ten years I have been preaching this doctrine with more or less success. On the side of professional and scientific pharmacy it gives me great pleasure to see such pharmacists as Hynson and Wescott, of Baltimore, Frank Morgan of Philadelphia, and such manufacturing houses as Parke, Davis & Co., of Detroit, and Dr. E. R. Squibb, of Brooklyn, and such wholesale drug concerns as Gilpin, Langdon & Co., of Baltimore, and several others. This is very encouraging, but it is discouraging to meet with such experiences as the following:

Some time ago I had a talk on the subject of pharmacy with a well known college president, Prof. M.D., and L.L.D., who said he considered that the pharmacists occupied the same position to him as his cook; and he did not care what either of them did so long as one furnished him with properly cooked food, and the other one with properly prepared drugs.

Again, a large pharmaceutical house, acting with a purely professional and scientific motive, spent years of costly endeavor in the investigation of standards for vegetable drugs and galenical preparations. As the result of these investigations it introduced a class of standardized preparations known as "Normal Liquids," and gave the entire work to science by presenting it to the committee for revising the United States Pharmacopœia. By so doing it practiced pharmacy as a profession; and deserves just as much professional and scientific credit and recognition as any physician in the land. And yet it has been openly advocated that while the work itself is of the greatest value to science, and to the profession, and should therefore be accepted because greatly needed, the name normal liquids should not be adopted because it would give this house great commercial prestige. As well might you

say to Dr. Koch, "Your work on the subject of bacteria as a cause of disease is excellent, and should be accepted, because of great benefit to science and the cause of suffering humanity; but while we accept your publications they must be contributed in an anonymous manner, because if any body should happen to find out the author of such valuable work it might give you great prestige as a practicing physician."

Finally, the question of standardizing medicines is one that merits consideration. "As laws are at present constituted a poison can be legally sold as such in most States only with a flaring label of warning, and after double or triple forms of registration by a competent pharmacist. Put it up as a patent medicine, decorated with a seductive title, and a rainbow wrapper, and at once it is beyond the restraints of regulation, and may be sold by street-hawkers, slaughter shops, anybody and everybody, without let or hindrance." Where is the consistency that discriminates by such strange partiality in favor of charlatanism, and does such injustice to intelligent pharmacists. I am informed that in France, the law is so strict that no one except regular physicians and first class pharmacists are allowed to put up medicines and sell them to the public. Laws should also be passed in this country restraining anyone from manufacturing and selling medicinal preparations without being properly qualified by education and experience.

Again, I am told that in France before anyone is allowed to market an article he is asked by the government for a copy of his formula and a sample of his preparation. Both are handed to a government analyst who makes a careful analysis of the article, and if it proves in any way below the standard prescribed in the formula it is suppressed. If it passes this examination it is directed by the Academy to be used in hospitals where patients suffering from the peculiar disease for which it is recommended are received; and there it is thoroughly tested for several weeks and the effects duly noted. If it proves effective then its compounder is allowed to manufacture and sell it, after the formula has been duly published in some standard work.

I have already referred to the interesting question now exciting so much interest in medical circles, viz., the standardization of vegetable drugs and galenical preparations. This is an excellent move so far as it goes, and I believe with my esteemed friend, Prof. Remington, that every important drug and important preparation should be standardized whenever a process can be devised which is practical, readily applied, and which is applicable to the needs of the pharmaceutical and medical professions as a whole. But I go still further than this and insist that every medicinal preparation introduced to the public should have some recognized standard, and the manufacture should

be held up to that standard by imposing severe penalties for adulteration. A national law to prevent the transit of adulterated products from one State to another, and State laws to control the manufactures in each State would probably be necessary.

To sum up the entire matter, therefore, I again assert that the manufacture and sale of medicine and the treatment of the sick is being diverted from its legitimate channel, which consists of the physician's prescription compounded by the educated apothecary, and directed into the hands of uneducated merchants ignorant alike of disease or its treatment. Both physicians and pharmacists are suffering much through this unfair competition, and many of the irregularities in the relations between the two professions can be traced to this cause. Science is hindered and scientific nomenclature seriously threatened; much of modern pharmacy has no place in literature whatever, and partial information only can be found in the advertising pages of medical and pharmaceutical periodicals which are destroyed at the end of the year. Pharmacopœias and text-books, dependent as they are upon this knowledge, are suffering the consequence; while students in our medical and pharmaceutical colleges cannot be instructed in the composition and use of many articles which they will afterwards use in their practice; physicians hesitate about writing articles concerning preparations employed by them in treating the sick, for fear they will be charged with dishonorable motives; journals object to receiving such reports, either because they are afraid that readers will think admittance to their columns has been gained through bribery, or because they prefer that all such mention shall go through their advertising columns and be well paid for. And finally, there is no protection to the public in this connection by either the medical, secular, or religious press; for the entire press of the country is so thoroughly subsidized by advertisers that there are but few publications sufficiently independent to say anything on a subject which may injure their advertising patronage. Taking all of these facts into consideration, is there not sufficient reason for alarm?

How then can this great evil be remedied? My suggestions are as follows:

1. I would suggest that an association be formed with a membership of both physicians and pharmacists to be known as the American Pharmacological Association.

2. For the purpose of ascertaining the true value of drugs and compounds now in use, as well as all new introductions in the future, I would suggest that a national laboratory be established to test drugs and medicinal preparations from all points of view, and that this laboratory be manned by physicians and chemists selected from the medical department of the Army, Navy, and Marine Hospital Service.

3. I would suggest that this national society, with the aid of the laboratory referred to, take up an investigation of the materia medica of the world to ascertain what substances are used by various nations as medicine—this to include both civilized and savage people. Such an investigation would be of immense profit not only to medical science, but such sciences as botany, anthropology, etc., etc., and could be carried out without great expense by the medical men in the employ of the government, who now have very little to do.

4. I would suggest the adoption of some such plan as that in use by France, whereby the manufacture and sale of drugs and medicinal preparations shall be limited to those qualified by education and training for this responsible vocation; that nothing shall be introduced as a medicine unless first submitted to the national laboratory and tested, first on animals if possible, and then by the hospital service throughout the country, after the true formula has been published, and the claims made by the introducer shall have been properly authenticated. It is better to experiment with patients in the hospital under proper restrictions than to leave things as they are at present, for the patent medicine trade are now experimenting on the public at large without any restrictions whatever. To carry on this work, "Working Bulletin," containing all obtainable information concerning the drug or preparation, should be extensively circulated to physicians connected with the hospitals throughout the country. And a monthly journal should be published as the organ of the National Pharmacological Society. Scientific expeditions should be sent out to explore uninvestigated parts of the world, hoping to discover valuable medicinal plants. Botanical gardens should be erected in connection with the work to further knowledge of the cultivation of medicinal plants.

5. Finally, I would insist that a patent should never be allowed for a medicine unless it be first proved to be a new and useful invention as a therapeutic agent by the tests that I have indicated. And then, if it be deemed wise on the part of the Government to grant a medical inventor the exclusive use of his invention for a limited time, I don't know as there is any objection to it.

This plan which I have suggested for investigating the materia medica of the world, is not so visionary as it might appear without due consideration. The working bulletin system, the hospital plan, the monthly journal as an organ of the work, the scientific investigation of the materia medica of various unexplored regions such as the valley of the Amazon, the interior of the Fiji Islands, and the Islands of Jamaica, are things that already exist, and have been carried out; and the journal I refer to, the *Therapeutic Ga-*

zette, is universally acknowledged by all authorities both in this country and in Europe to be the leading journal in therapeutics in the English language. So far as the working bulletin system is concerned, if the profession would do its share the bulletin would become far more valuable than they are at present, though they receive compliments from every quarter. If so much can be accomplished as has already been done by the enterprise and liberality of a private corporation, Messrs. Parke, Davis & Co., of Detroit, how much more might be accomplished if it was taken up with all the resources of the United States Government. Under proper governmental auspices the work would be raised to a level where it would be no longer hindered by the attacks of business competitors, who do not hesitate to ascribe the most selfish motives to every move that has been made. And it would be no longer crippled by the constant attacks of the proprietary medicine trade who greatly fear any plan calculated to destroy their monopolies and prick their bubbles.

The following comments, received from well known authorities, well illustrate the favor with which the plans suggested in this paper have been received.

Prof. Spencer F. Baird, Secretary of the Smithsonian Institution, when I submitted the plan to him originally, said that I might tell my friends that in his opinion it was one of the most important plans ever submitted to the Institution.

Prof. H. G. Beyer, Curator of the National Museum, in a letter written October 20th, 1885, says: "I most sincerely sympathize with you in your plans of trying to organize the association you speak of, and you may depend on my hearty coöperation in the matter, so far as I am able to assist you. I think your conception of establishing a Bureau of Department of Pharmacology under the Government a grand one, and no doubt one that ought to be carried out. We have here all sorts of scientific Bureaus, and it seems to me not one which is calculated to be of such immediate benefit to mankind as a Department of Pharmacology would be to the American people, not to speak of the immense scientific value it would be to medicine and pharmacy. I, for one, should certainly hail the inauguration of such an institution with great delight. It is exactly what I have been having in mind for the last year and a half."

THE eighth annual meeting of the New York State Medical Association will be held Wednesday, Thursday and Friday, October 28, 29 and 30, 1891, at the Mott Memorial Hall, 64 Madison avenue, near Twenty-seventh street, New York City. Sixty papers appear on the programme.

THE FUTURE CHEMIST.

Read in the Section of Materia Medica and Pharmacy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY CHAS. T. P. FENNEL, M.D.,
OF CINCINNATI, O.

When I was invited to undertake the honorable task of presenting a paper on this memorable occasion, the beginning of a new era for physicians and pharmacists, I felt a hesitancy in accepting, being cognizant of my unfitness to select and consider a subject worthy of, and of equal importance to, both professions.

The beginning of a new era! American medicine has extended her arms and taken unto herself American pharmacy. The vocabulary of the English language is inadequate to express the gratitude due to the American Medical Association. Henceforth, the two professions go hand in hand; and if we are only content to await the harvest of the seed that has been sown, our granaries will, in good time, be filled with golden grain.

All nations reverence antiquity. Historians have ever been ambitious of tracing back their subjects to the most remote antiquity. Writers on medicine and allied sciences have not manifested less eagerness to discover the origin of their art, but in every attempt to thread the stream to its source, were soon lost in the wilds of conjecture or the regions of fable; indeed, it is very unlikely that we should be able, by the most indefatigable research, to approach the period when remedies were first applied for the alleviation of bodily suffering, or to discover any country, no matter what its state of civilization might be, in which its native inhabitants were destitute of medical resources. Looking back to my early days, when I learned the rudiments of practical chemistry in the laboratory of a pharmacist, I can fully realize and appreciate the gradual but wonderful advancement made in the last twenty-five years.

Retrospection and introspection. What lessons of practical wisdom do they unfold? What reminiscences may they call forth, and what beacons for future guidance reveal? Epochs in the life of man, when he feels how little he knows, and how much of Nature's secrets are still to be unraveled.

The close of every decennial marks an epoch in the history of American pharmacy, and it is well to look backward for a moment upon the past, and see what has been accomplished for the betterment of American pharmacy.

In the progress of civilization, pharmacy has kept abreast of the other natural sciences, which is substantiated by the improvement in each succeeding pharmacopœia. American pharmacy has completed another period of time in its history. A new pharmacopœia will be upon us before long.

and, judging from the preliminary labors, will be a credit to American science.

Comparison alone will forcibly impress one with the absurdity of some, and the total inactivity of many preparations.

Impelled by curiosity and a desire for information, one seeks to inquire for the reason why some substances, held at one period in the highest esteem, should have fallen into total neglect; why others, of apparent insignificance, should have held their position so steadily, and again, why others which have been denounced as inert and worthless, should have been raised into special favor once more.

Superstition and speculation have been laid aside for fact and demonstration. Medicine and pharmacy are no longer in the category of a craft or a delusion, but sciences established upon solid and definite bases.

The advances made in the science of medicine are, in a great measure, due to the discoveries in chemistry by the early pharmacists, and who, in reality, are the founders of modern chemistry. In tracing the history of chemistry, not in the sense of the science of to-day, from its earliest period, we find that its progress to its present advanced state has been exceedingly slow. Chemistry is virtually as old as the history of mankind—a rash assertion, perhaps, but one which may be defended by the statement that vinegar is mentioned in the Old Testament, and is in all probability the oldest acid known.

To prolong life was a problem that engaged the attention of mankind from the earliest ages. It was not until the rise of alchemy, however, that the search of an elixir vitæ as a scientific possibility engaged thinking men. The science of alchemy can be traced back to the third century, though efforts have been made to trace the origin, by tradition, to Egypt. Geber and the great physicians of Arabia were the representatives of alchemy; the time constituting the second period of the history of chemistry.

The next period is known as the time of medical chemistry.

The results obtained were the work of physicians, among whom Paracelsus stands preëminent. All the investigations were made in reference to the healthy and diseased condition of the human body, and the consideration of remedies that would restore the equilibrium displaced by disease. There was a long time between Geber, Paracelsus and Priestly. The birth of modern chemistry is accredited to the eighteenth century, Priestly and Lavoisier dealing the death-blow to alchemy and iatro chemistry. During these periods of time, more or less attentive observations had been made on the properties of natural bodies, various theories had been formed, and different ideas had been entertained concerning the nature of those bodies. The greater proportion

of these were vague and unwarrantable, and in many instances positively absurd.

The fate of these cautioned the judicious part of the inquisitive world of the necessity of substituting experiment and strict mathematical reasoning for the suggestions of the imagination.

This rational reform, which commenced with the seventeenth century, was productive of a vast number of useful discoveries.

We may well quote Sylvester Baxter: "As in a journey from one climatic zone to another, we have been slowly leading up to new conditions; but the changes, like the movements of a clock's hour hand, are so gradual as to be scarcely perceptible. Suddenly we are aware that circumstances have become quite different from those we remember well back in our way."

Medicine, chemistry and pharmacy are not independent sciences, but dependent upon each other. Every particle of matter in the cosmos bears some sort of relation to every other particle of matter in the cosmos. The advances made in one direction, will naturally be available for further progress in another direction.

Scheele, the Swedish chemist, enriched the science with many discoveries, and contributed much to the progress of practical chemistry.

These discoveries gave new impulse to the study of medicine. In fact, no progress could have been made in medicine without the key of Priestly's "Oxygen," unlocking the secrets of nature.

The advancement of medicine, more so than that of chemistry and pharmacy, has been continually arrested, and often entirely subverted, by the caprices, prejudices, superstitions and knavery of mankind.

American medicine and pharmacy are, to some extent, still the sufferers from the same causes. But we are leaving the oft trodden path of history, and must go back in time to secure the evidences which make the sciences of to-day. Apparently as marvelous as the discovery of the elixir vitæ or the philosopher's stone, were the discoveries by Sir Isaac Newton in 1675. Amongst all the discoveries of modern science, none has deservedly attracted more attention than the results of the application of spectrum analysis to chemistry.

What have not the discoveries of Newton done for medicine?

The application of the principles involved in his discoveries increased the technique of the microscope. Leeuwenhoek may justly be called the father of scientific microscopy, and as having set a most admirable example of scientific method in the prosecution of biological research. These methodical investigations, and the realization of results in the domain of the invisible world, have progressed with such wonderful rapidity as to be almost beyond belief.

We have reached the dawn of a new era in medicine and chemistry.

Observations have shown that in the decompositions of all organic matter, and in disease, microorganisms will result.

All animal and plant life consists of a mass of complex, unstable chemical substances, capable of being oxidized and reduced to simple, more stable substances, with the setting free of energy. This continual setting free of energy constitutes a drain which must be met by constantly renewed supplies, which we call food. When animal or plant life is supplied with appropriate food material, and exposed to favorable external conditions, we perceive continual changes of construction and destruction.

The processes of decomposition, by which relatively simple substances are produced from relatively complex ones, form the issue of to-day.

The most active agents in producing chemical changes are bodies which are termed "ferments," and the process fermentation and putrefaction. Originally, the term "fermentation" implied the effervescence and evolution of carbonic acid gas; but the accepted definition of to-day implies peculiar changes to which complex organic substances are liable. Putrefaction is virtually a process of fermentation, and only differentiated from it by the products of decomposition being of a disagreeable and obnoxious odor. The ferments are distinguished as organized and unorganized. But little is known of their chemical composition, and much less, in fact, nothing, is known of the properties upon which their characteristic action depends. As examples of organized ferments, we have yeast and bacteria. The former we know to be a very complex mixture of fats, cellulose, albuminoid nitrogen and salts; the salts consisting of phosphate of magnesium, potassium and calcium; but of its constitutional structure we know nothing, and much less upon what action depends.

To the casual observer the souring of wine or milk, the spoiling of all kinds of food products, might appear spontaneous, without the application of any substance from without.

The chemist is well aware that the changes are non-spontaneous, and hence must be produced by substances or reagents, although these may not enter as a factor in the mathematical chemical explanation. These are the peculiar changes to which complex organic substances are liable, and many theories have been advanced to explain these processes.

Experience and observation have proven that fermentation always takes place in the presence of water, under varying temperatures and in contact with some specific ferment. Although apparently the ferment does not contribute to the final product, its presence is essential. Berzelius called it catalytic action; that is, by contact.

Stahl claimed that the preëxisting molecular motion was disturbed by the molecules of the ferment, and caused the formation of new compounds, in which the molecular motion was equalized by the disturbing element.

Liebig claimed that the unstability of albuminoid substances in the presence of water was so great, that the least oxidation would disturb the chemical equilibrium to such an extent as to rearrange the atoms to form new compounds of greater stability.

So far, the question of process had been considered from a purely chemical standpoint.

Schwann, Cagniard and Latour examined the so-called yeast ferment under the microscope, and found cells similar in character to vegetable cells, and that these, under proper conditions, increase and multiply.

They naturally concluded that yeast is a species of plant, and that the life of this plant produced the change.

The theory advanced was readily taken up by others, amongst whom Helmholtz, Mitscherlich, Hoffmann, Schroder and Dusch did admirable work, but not one of them made any really progressive move. It remained for Pasteur to repeat all known experiments and verify them, but his renown was established in cultivating pure growths of each species, and examining each for its chemical action.

Ferments have been classified according to the nature of the chemical changes which they induce; that is, oxidative and splitting fermentation. A few coming under the head of the latter may be produced by purely chemical means.

The conversion of cane sugar into dextrose and levulose can be accomplished by purely chemical means, by the use of strong mineral acid, especially sulphuric acid.

Organized ferments, as the yeast plant, cannot ferment cane sugar directly, while it can induce the alcoholic fermentation in the glucoses. In the fermentation of cane sugar by the yeast plant, the same splitting up of the atoms of sugar must take place as is accomplished by chemical means, in order to induce alcoholic fermentation. This process, known as the inverting of sugar, is produced by a soluble ferment which accompanies, and is probably produced by, the yeast plant itself.

Fermentation is no doubt a nutritive process for the ferment-producing organisms, with its consequences.

In like manner, the butyric fermentation follows the lactic fermentation. Changes are produced in the albuminous constituents of milk by the lactic ferment, which is conducive to the health and growth of the butyric ferment.

The proteids of milk must consist of more than the single complex substance which we call casein, for its precipitation with neutral salts, acetic

acid or coagulation, is not accompanied with uniform results. I feel satisfied that the day is not far distant when it will be shown that the so-called casein consists of a soluble and an insoluble part, possessing different properties, and exerting influences characteristic of each.

Analyses of milk, preserved and condensed by recognized authorities, are so at variance with each other, that it is impossible for the chemist to decide upon a standard.

The conversion of starch into dextrine and dextrose, milk sugar into saccharine bodies, one crystallizable, the other not; decomposition of glucosides, are all possibilities of the chemist.

The agent used to accomplish the desired result, and taking the place of the ferment, does not enter into the chemical equation, any more so than the ferment.

The fermentation produced by the unorganized ferments, diastase, emulsin, myrosin and erythrozym, cannot, by chemical means, be produced with like results.

The digestion of the food is nothing more than a physiological fermentation which food undergoes previous to its absorption.

According to Charles and Landois, the gastric fermentations of proteids end with the formation of peptones, soluble and diffusible.

The pancreatic fermentation is more complicated, the results of decomposition being peptones, leucine, tyrosin, aspartic acid and glycocoll. As a subsequent result, we find that the medium is now conducive to the growth of microorganisms, the products of their process of nutrition being indol, scatol, phenol, fatty acids, hydrogen, carbonic acid gas, dihydrogen sulphide, ammonia, and finally ptomaines.

An artificial digestion of albuminoids is partially accomplished by dilute hydrochloric acid, but the resultant product does not deport itself as a peptone. The products of pancreatic fermentation have never, so far as we have knowledge, been obtained by chemical means, although it has been found, by experiment, that artificial pancreatic digestion readily advances to the putrefactive stage, with the formation of like products.

In all the various forms of fermentation, whether by organized or unorganized ferments, the processes are in the nature of a progression, the evolution is gradual, but each stage is dependent upon the preceding one. The process may be interrupted, but it never can become retrogressive. The ferment may be constrained to live under abnormal conditions, but it soon becomes exhausted, unless revived by artificial means. Under such conditions, it is not surprising that standards may appear arbitrary and misleading.

Aside from the data furnished by chemical analysis, other factors must be introduced, the source and nature of the source, and the consid-

eration of the influences, light, air and heat.

It is therefore necessary, to obtain conclusive results, to take cognizance of the inevitable decay, whether a process of fermentation or putrefaction, influenced by living organisms, or a chemical decomposition with the formation of compounds conducive to the growth and development of living microorganisms.

The scientific, as well as the pharmaceutical chemist, can no longer stand alone, he must call to his aid the biologist; and where could he have better opportunities to find him than among the medical profession.

The results of their combined efforts will furnish indisputable facts, and be based upon biological-chemical data as solid as the rock of ages.

The American Medical Association has indeed performed a noble act, in offering the opportunity for developing a higher culture and a more comprehensive education.

PHARMACY FOR MEDICAL MEN.

Read in the Section on Materia Medica and Pharmacy at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY P. W. BEDFORD, M. D.,
OF NEW YORK.

The education of the medical student of the past as well as of to-day is neglected in one of its most interesting and necessary departments, that of pharmacy. It is not necessary to ask any one of this assemblage as to the amount of actual experience he has had in the handling or manipulation of the drugs he prescribes, or whether he has ever prepared the prescriptions he directs for his patients. There are doubtless some who have had such education or experience, but they are the exceptional cases. Those that have had the previous training of the pharmacist or who may, during their student life or at some subsequent opportunity, have given attention to the subject of pharmaceutical manipulation, invariably attest its great advantage to them in their future professional success, both in the curative as well as the educational experience. It has come under my own observation in numerous instances that the student of pharmacy, who at a later period becomes a student of medicine, is apt to be a leader in the profession of the healing art.

My object in the very brief paper that I bring to your notice, is to urge that in the curriculum of the medical student there should be some place assigned for such an amount of pharmaceutical instruction as would enable him to know, by practical work as well as lectures, the things that specially interest him as a provider of the "ways and means" of restoring health to the ailing and distressed. I believe that it is conceded that even yet there are many medical grad-

uates who in their practice find it necessary to carry to their patients in remote places the remedials as well as the advice, and if this be so the medical colleges should provide methods of instruction in this department. There is not the need that either of the professions should usurp the border-land which divides the one into a class whose function is to diagnose the difficulty and devise a method of relief or cure, and the other to carry into effect the suggestion of the former observer. It is wise that each, however, should have the knowledge which goes farther than simply to have memorized facts or statements made by the professor to whom he listened, and that as "practice makes perfect," so there should be an earnest effort made to give the medical student a practical acquaintance with the drugs, chemicals and preparations he is in the future to depend on for success in his combat with disease. The department of "materia medica" should, like the title of the section under whose beneficent wing we gather today, have a permanent suffix, the additional title, "and pharmacy," or it would be still better to dignify the college as well as the position by adding to the professorial ranks a special department and a "professor of pharmacy."

The work and teachings need not be, in fact, should not be, the same as to a class of pharmacists; rather would it be a series of practical demonstrations to a class of twenty or thirty students at a time, and each be required to go through a regular graded course of practical work following the oral instruction or lecture given.

With such a brief but comprehensive plan of instruction for medical students in the future, we will have an improvement in the merit and appearance of prescriptions as they are dispensed, the products are more likely to represent the advanced knowledge of the times, and the prescriber be more in touch with the pharmacist in the needs of efficient yet reliable medication. For the practitioner of to-day we would urge that a little more thought be bestowed on the "prescription," that it be a trifle plainer in its chirography than the average sample of what the busy practitioner sends out as his request for remedials, and that the combination be so arranged that it is free from those incompatibilities which make the product one which is unsightly to the patient, striving to please the eye and palate while retaining efficiency unimpaired. The outline for such instruction which is appended to this paper is merely a suggestive one, but which may form a suitable basis to be varied as may best suit the convenience and arrangement of instructor and class. It is, however, urged that there appears to be but little work of this kind as yet attempted in medical colleges, so far as appears from their printed prospectus, and it is believed

to be one of the important sections which should be impressed on the medical student.

THE PHARMACY OF CRUDE DRUGS AND THEIR PREPARATIONS. CLASSIFICATION AS TO THEIR PHYSICAL CHARACTERISTICS, ROOTS, BARKS, LEAVES, FLOWERS, FRUIT, SEED, GUM, RESIN, GUM RESIN, OLEORESINS, BALSAMS.

Of the 261 articles from the vegetable kingdom which are official in the U. S. P., 1880, all are either under the above classification or are products of the same. For the therapeutic study of these articles as remedials they might be re-classified in appropriate tables for reference and study under the title of the remedial action they exert, as anthelmintics, antipyretics, astringents, cathartics, diuretics, nervines, etc. For their pharmaceutical consideration they may be best studied by taking the crude drugs in the order given above, noting the methods of reducing them to a condition in which they can be made serviceable for medication, as also yielding such preparations as the U. S. P. calls for as obtained from them.

This will bring in the processes of drying, concussion, grinding, sifting, preparing graded powders, and permit of showing methods of detecting adulterations and sophistications of the drugs in the whole and powdered condition.

From the drugs may be prepared at the several succeeding lessons as practice work:

Infusions: The official and other non-official.

Decoctions: Of various drugs.

Tinctures: Aconite, benzoin, kino, cinchona co., guaiac, nux vomica, opium, squill.

Syrups: Tar, wild cherry, rhubarb, squill, senega, tolu.

Fluid extracts: Gentian, ergot, cotton root, ipecac, licorice, hyoscyamus, senna.

Extracts: Indian hemp, gentian, hyoscyamus, nux vomica, opium.

Solutions: Mucilage, acacia.

Expressed oil: Cotton seed, castor oil.

Volatile oil: Clove, cubeb, cinnamon, copaiba.

Distilled waters: Water, (unofficial) from cinnamon, fennel.

Resins: Jalap, podophyllum.

Oleoresins: Cubeb, ginger.

Mixture: Ammoniac, almond, asofoetida, emulsion cod liver oil, emulsion turpentine.

Pills: Aloes, cathartic comp., rhubarb comp., nitrate silver, permanganate potassium.

Powders: Ipecac and opium, jalap compound.

Ointments: Belladonna, gall, veratrine, suppositories.

Alkaloids: Quinine, morphine.

Glucoside: Santonin, preparation of various prescriptions, incompatibilities pointed out.

Following the guide of the U. S. P., the dis-

ensatories or Remington's practice of pharmacy, this outline will bring into service nearly all the manipulations that appertain to preparing and dispensing medicines except purely chemical work, and could well utilize two hours each of fully twenty gatherings.

THE PHARMACY OF CHEMICAL PREPARATIONS.

Laboratory work should be an absolute requirement for each medical student, and the explanatory lecture of half an hour should be followed by two hours practice by the class. This course should begin with practical work in weights, measures, and specific gravity, and no one should be excused from this until he thoroughly comprehends and satisfactorily demonstrates the principles involved, both orally and practically. The relations between the Centigrade and Fahrenheit scales should be equally expressed. The effects of solvents on chemicals should be studied, then heat in its various applications, for each operation selecting some process which will make some pharmacopœial article. Evaporation of solutions furnishes the methods of crystallization, granulation and exsiccation. Sublimation will give opportunity to study the products of arsenic, mercury, sulphur, and other volatile bodies. Distillation will enable many of the acids to be produced and experimented with for identification and purity, and heat evolves most of the gaseous bodies so that they may be studied.

Precipitation is a means of producing many chemical bodies, and this process is capable of illustrating interesting facts which also apply to other branches of pharmacy than chemicals. The arrangement of the rest of the course should be devoted to a systematic method of making the more prominent chemicals, as also analytical work to determine the presence of substances in mixtures furnished the student, so that the general course of metals, acids, inorganic and organic bodies, that belong to pharmaceutical chemistry, can be covered. The reactions of chemicals in galenical preparations as are frequently prescribed should be prominently dwelt on during the latter part of the course. Volurtric and urine analysis will be a fitting conclusion to such a course of instruction. Such a course should cover about twenty-five lessons as a minimum.

When it is not possible to introduce such a course of practical demonstrations and work as is outlined above, then from ten to fifteen hours should be given during each session, and one hour should be given with practical illustrations. This might include weights, measures, specific gravity, subdivision of drugs, division and dispensing of powders, the preparation of pills, and the galenical preparations in briefer scope than in the former outline; demonstrations showing the in-

compatibilities of chemicals with each other and with galenical preparations; and special attention to such prescription work as will best accord with the teachings of the professor of materia medica and therapeutics attached to the same institution.

THE DRAINAGE OF CHICAGO.

Read at the Seventeenth Annual Meeting of the Mississippi Valley Medical Association, held at St. Louis, Mo., Oct. 14-16, 1891.

BY JOHN B. HAMILTON, M.D., LL.D.,
SURGEON, AND FORMERLY SUPERVISING SURGEON-GENERAL MARINE-HOSPITAL SERVICE OF THE UNITED STATES; PROF. OF PRINCIPLES OF SURGERY AND CLINICAL SURGERY, RUSH MEDICAL COLLEGE; PROF. OF SURGERY CHICAGO POLICLINIC; HONORARY MEMBER SOCIÉTÉ FRANÇAISE D'HYGIÈNE, PARIS, FRANCE, ETC.

The distinguished chairman of the committee of arrangements informed me that a short address of some kind would be required of me at this meeting, and that as the audience would not be confined to members of the Mississippi Valley Medical Association, some topic connected with public hygiene should be selected.

Being sincerely desirous to please my amiable friend, Dr. Love, I thought it might not be inappropriate to briefly consider a topic of interest to all the members of the Association, namely, the Drainage of Chicago.

There are some side questions connected with this subject that are of very great interest, and I shall refer to them, but the limitation of time will only afford opportunity for a statement of the sanitary problem, and of the manner in which those in authority propose to solve it.

TOPOGRAPHY AND CLIMATOLOGY.

Let us glance at the topography of Chicago as it was before artificially changed.

The oldest map of this region¹ is said to be still in existence in Quebec, and bears date of 1688.

Lake Michigan is correctly outlined, and the Chicago river properly placed and the French "Fort Chicago" located at its mouth. This map gives the formation of the Illinois river from the Desplaines and Kankakee. From the report of Surgeon-General Lawson,² in 1840, I quote the following:

"Fort Dearborn, lat. 41° 51' N., long. 87° 15' W. This post, now abandoned,³ is situated on the southwest shore of Lake Michigan, in the State of Illinois, twelve miles from the Wisconsin line. It is distant from the lake 250 yards, and is elevated fourteen feet above its surface. The river Chicago, which runs on the three sides of the fort, divides half a mile above it into two branches, the one north and the other south, in directions

¹ Davidson and Stuvé's History of Illinois.

² Statistical Report on the Sickness and Mortality in the Army of the United States, from January, 1819, to January, 1839. Washington, 1840.

³ Fort Dearborn was established in 1804. J. B. H.

nearly parallel with the lake shore. As the bank of the lake is several feet higher than the ground in the rear, the latter is sometimes covered with water. Indeed, the whole country is so low that in its early settlement boats frequently passed, during the spring floods, over the prairies from Chicago to the Illinois river. At this post the prairie opens upon the lake four miles wide, extending west beyond the reach of the eye. Above and below this point, the shore of the lake is densely covered with large forest trees, such as the different varieties of oak, ash and hickory. The soil is generally a rich loam; in some places clay, in others sand, predominating. Limestone is found in large quantities. . . . This position is one of our most salubrious military stations."

Dr. Drake⁴ in 1848, in his classical work, wrote:

"Chicago, the commercial metropolis of Lake Michigan, stands on a low sand plain, on the western side of the lake. The breadth of this flat along the lake is about four miles, whence it runs back ten or twelve miles to the river Desplaines, an elementary branch of the Illinois. When the lake stood at a level only twenty feet higher than at present, its waters overspread this bed of alluvion, and a portion of them flowed down the Illinois. At this time it is a savanna, abounding in marshes and low sand ridges, traversed by the river just mentioned on the west and on the east by the north and south forks of the Chicago river, or creek; which, flowing nearly parallel with the lake shore, unite within it and form a short common trunk, which meanders through its centre to the lake. The water in this natural channel is twenty feet in depth, and rises and falls from the force of the winds upon the lakes about two feet; a fluctuation which tends to carry away the filth which would otherwise accumulate on its margins, from the houses on each side, and from the vessels which seek it, as the only harbor of Chicago. From the mouth of this river there is a gradual rise of the plain to the height of twenty feet; which may be attained by ascending the south fork of the river to a spot whence streams sometimes flow to the east and west on which canoes have passed from the lake into the Illinois river. The canal from Chicago to Peru now passes over that summit level which is the lowest between the Gulf of St. Lawrence and the Gulf of Mexico, being in round numbers only six hundred feet. Near the lake shore the winds are constantly blowing a fine dark colored sand on the margin of the plain, which south of town is raised into low ridgy dunes. The town-plat, from the destruction of the coarse aquatic vegetation, and the tramping of men and animals, is constantly becoming dryer and firmer. Beyond these influences much of

it inclines to marshiness; but as it is not subject to inundation and is high enough above the Chicago and Desplaines rivers to be drained by a judicious system of ditching, it will no doubt, as the population increases, be entirely reclaimed. . . . In the year 1831 the town itself was commenced and at this time, 1848, its population is nearly twenty thousand. The city is supplied with water from the lake, through a hydrant system. A growth so rapid indicates its prospective importance and entitles it to the regard of the Medical Topographer. . . . The statements of Doctors Boon, Davidson and Brinkerhoff fully sustained the impression made by the others (Brainard and Kimberly) and convinced me that the town of Chicago has been more infested with autumnal fever than Fort Dearborn had been, which goes to strengthen the prevalent opinion that the first exposure of the new soil to the sun, rain and air is insalubrious. A part of this turning was by the plow, another by the spade in the excavation of the canal. This operation deserves some notice. The canal stretches southwesterly from the town completely across the plain. One of the contractors told me that in 1838 he had excavated a mile. The average digging was to the depth of four feet through soft black mould, abounding in organic matter. The distance to which this silt was spread out on each side was such as to cover a parallelogram of the average width of two hundred and eighty feet exposed to the sun and rain. Nearly all who resided along the line of excavation suffered with autumnal fever; and almost all the laborers (Irish immigrants) suffered in the same way. Several died with malignant or congestive symptoms."

Such were the natural conditions, forty years ago, and now there has been placed upon this naturally unpromising site, more than a million of people, and it is estimated that since the census was taken there has been nearly two hundred thousand souls added to the population.

DRAINAGE.

Within ten years after the period mentioned by Dr. Drake, the river had become so contaminated as to cause uneasiness, and in 1855 the Illinois legislature passed an act creating the Board of Sewerage Commissioners, and in 1856 the systematic construction of sewers was commenced and soon the Chicago river became what it now is, little else than an open navigable sewer. It soon became evident that some system of cleaning the river must be adopted, and in 1860 the sewer commission recommended the widening and deepening of the canal. Not only to provide a safe outlet, but to accommodate the increasing trade of commerce with the interior. This idea was expanded into the project of a ship canal, which now seems near realization. The legisla-

⁴ On the Principal Diseases of the Interior Valley of North America. Cincinnati, 1850.

1889, passed "An Act to create Sanitary Districts and to remove obstructions in the Desplaines and Illinois rivers." This act created a Board of Trustees and gave them the necessary powers.

The Board have now completed the survey of the proposed canal route and are engaged in confirmation of the real property through which the canal must pass.

This conclusion was reached by the legislature after exhaustive inquiry into the various plans proposed and the existing conditions, by the State Board of Health. That body reported, through its secretary, Dr. Jno. H. Rauch, who had many years given the subject his careful attention, that the water supply of the city was endangered by the river emptying into the lake; and that the pumping works were inadequate to continuously change the current of the river; that sewage can not be profitably utilized as a manure, and taking out the solids by chemical treatment does not render it safe for domestic purposes; that seventy per cent. of the Chicago sewage passed down the Desplaines and into the Illinois river; and that the proposed canal would do less than any other mode of the disposal of so large a body of sewage. The board further demonstrated in answer to the fear of those in the Illinois valley, that the river was already greatly polluted by the sewage of the several towns and cities in the Illinois basin, and that in the near future it would be necessary to flush the Illinois from Lake Michigan even if the Chicago sewage were otherwise disposed of.

The soundness of these arguments prevailed, and it is now proposed to construct a canal that will give a dilution to the sewage of 60,000 cubic feet per minute for each 100,000 of population, or not less than 24,000 cubic feet per minute when the population shall have reached 2,500,000.

The following tables were extracted for Mr. Livingston from the report of the State Board of Health:

ANALYSIS OF WATER OF THE ILLINOIS AND MICHIGAN CANAL AND ILLINOIS RIVER.—("A.")
Parts per 1,000,000. Summer 1888. (Table from State Board of Health Reports.)

Place.	Distance	Water-shed sq. miles.	Total solids	Suspended Matter.	Chlorine.	Free ammonia	Albuminoid ammonia	Oxygen consum'd	Nitrogen as Nitrates.
Report . . .	0		47.12	12.92	4.68	1.225	0.256	2.31	0
Report . . .	28		43.12	6.98	4.61	1.088	.199	1.62	0
Upper . . .	33	1,392	44.17	9.40	3.91	0.745	.167	1.57	0
Lower . . .	34		44.27	10.79	4.37	0.893	.168	1.43	0
St.	58	7,296	35.59	3.08	3.21	0.411	.071	1.09	.038
Le.	95	11,847	34.57	5.03	1.97	.064	.053	0.86	.104
Y.	124	12,642	30.60	2.75	1.77	.047	.048	0.87	.068
R.	159	13,479	32.98	5.43	1.24	.021	.052	0.98	.089
l.	170	13,831	35.30	8.43	1.62	.064	.065	0.94	.080
na.	201	15,364	30.18	4.54	1.16	.034	.043	0.81	.073
stown . . .	232	23,444	39.00	8.47	0.75	.020	.038	0.74	.062
on.	322	27,914	30.16	5.03	0.92	.009	.048	0.73	.058
Mississippi									
at Alton	340		27.86	7.52	0.41	.017	.036	0.74	

ANALYSIS OF WATER OF SOME OF THE TRIBUTARY STREAMS OF THE ILLINOIS RIVER.—("B.")
Parts per 1,000,000. Summer 1888. (Table from State Board of Health Reports.)

Place.	Total solids	Suspended matter.	Chlorine.	Free ammonia	Albuminoid ammonia	Oxygen consum'd	Nitrogen as Nitrates.
Dupage River below Joliet.	29.47	1.41	0.58	.042	.035	0.47	0.31
Kankakee River below Joliet.	25.14	3.56	0.14	.008	.059	1.44	.009
Fox River below Morris	33.03	4.63	0.42	.012	.047	0.68	.003
Big Vermillion River below Morris	45.06	8.78	0.55	.013	.034	0.69	.036
Little Vermillion River below Morris	37.31	3.08	0.57	.018	.041	0.72	.036
Sangamon River below Havana	31.78	7.07	0.36	.005	.028	0.55	.075
Mississippi River . . .	27.86	7.52	0.51	.017	.036	0.74	

The Citizens' Association of Chicago, established in 1874, composed of most influential citizens, also warmly favored the Desplaines outlet system, and by many cogent arguments favored it. The only objection worthy of consideration that has been urged against this plan is the allegation that the danger to the people drawing their water supply from the Illinois river will be materially increased. This objection cannot be set aside by a general denial. They assert that pathogenic germs in sewage are not destroyed by dilution and that the solid matters are simply deposited with silt on bars and shoals. This view has lately been strongly supported by Frankland at the Congress of Hygiene and Demography, held in London, Aug., 1891. Frankland asserts that chemical evidence of the self purification of the waters is insufficient, that there must be a bacteriological examination as well. He admits, however, that sedimentation, (or the subsidence of solid particles) carries with it a very large number of microbes, and the fact remains that dilution, oxidation and sedimentation are so far the only known means of comparative purification of running streams.

Of these the current belief is that dilution is the most efficient factor, and its effects on sewage is the same as is observed in the dilution of gas from chimneys. No one claims the destruction of noxious gases, but when poured into the open air they become so diluted as to be practically harmless.

At the same time it cannot be too strongly urged upon municipal authorities, that contaminating substances be kept out of running streams as much as practicable. Garbage can always be burnt, and other substances can be disinfected before being turned into the sewer.

But notwithstanding these precautions, and notwithstanding the great dilution proposed, in my judgment, intercepting sewers, to be constructed on each side of the river, and the lake front as well, will inevitably become necessary with the growth of the city.

THE WATERWAY SIDE OF THE QUESTION.

I have thus far only reviewed the case from

the standpoint of the sanitarian. There is another view almost as broad, and that is from the standpoint of the publicist. This involves the question of the physical effects of creating a new river 200 feet wide and 18 feet deep, the probable lowering of the lake level; the economic results of the vast waterway thus created, by providing means for increase of traffic, and additions to the trade of the valley, and the political effects of the closer commercial relations between the people on the borders of the lake, river and gulf, but as my time has already expired, I will refer you to the excellent paper of Mr. McMath, C. E., of St. Louis, and the elaborate one of Mr. Cooley.

DEFORESTATION.

I cannot close without reference to a topic of the utmost demographic importance to this entire valley, and that is, the subject of deforestation.

The National Conference of the State Boards of Health which met in Nashville, May, 1890, adopted the following resolution:

Resolved, That recognizing the well-known evils resulting to the whole nation from the disastrous floods which within recent years have taken place along the valleys of our great rivers; and from the destructive cyclones which from time to time occur, both of which evils have been pointed out to be due mainly to the cutting down of the forests on the mountains and along the hillsides where our great rivers take their origin, and to the violence which the wind storms obtain blowing over great tracts of practically treeless prairie, this National Conference of Health Officers desires most earnestly to bring these evils to the attention of our Federal government, our State and provincial legislatures, and other scientific and commercial bodies, urging them to take such comprehensive action as will (1) cause a survey to be made of the gathering grounds of our great rivers. (2) Preserve, and replant when necessary, these areas, with protective forest trees. (3) Establish schools whereby the principles and practice of forestry will be taught, and protect by the most stringent legislation the results of the above mentioned work. (4) Make recommendations to our towns and cities to form park associations for the planting of trees and obtaining possession of waste lands to be gradually reforested.

Last year at about this season, I made a journey through Italy and saw the Appenines extending from the north to the south of Italy, as an almost treeless, rocky ridge. The soil had long ago washed down the sides, and the almost everlasting rocks stand out as monuments of the ignorance and wastefulness of man.

We, in this yet new world, should realize that deforestation means general devastation, and that unless checked, our country may also become a desert. We may see in the orient, what may be the result of the fatalistic doctrine of "letting posterity take care of itself," and we may see in the example of Germany a nation strong and vigorous, that guards its forest trees as the "apple of its eye."

We have the power to stay the floods, to regulate the seasons, to preserve the natural water courses, and prevent much disease by increasing

the tree bearing area, and surely our countrymen have wisdom enough, and patriotism enough to lend their influence toward reforestation of waste lands, and the establishment of parks every village.

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CAMPBOR-MENTHOL IN CATARRHAL DISEASES.

Read at the Seventeenth Annual Meeting of the Mississippi Valley Medical Association, held at St. Louis, Mo., Oct. 14-16, 1894.

BY SETH S. BISHOP, M.D.,

OF CHICAGO.

SURGEON TO THE ILLINOIS CHARITABLE EYE AND EAR INFIRMARY, ETC.

While engaged in experimenting on an improved inhaler for catarrhal patients I observed that menthol crystals and camphor gum formed a clear, oleaginous liquid on coming into contact with each other. It occurred to me that such a combination ought to have a beneficial action in catarrhal affections of the nose and throat.

I mixed equal parts by weight of camphor and menthol, and combined 20 per cent. of the resulting fluid with 80 per cent. of lavoline.

¹ Discussion on the Levels of the Lakes as affected by the proposed Lakes and Gulf Waterway by Messrs. Wisner, Cooley, Herschel.

The first case in which I tried its effects was from which I had removed hypertrophied tissues from the right nasal cavity and used the tery in order to open the passage way, not for breathing purposes, but in order to facilitate the introduction of the Eustachian catheter. Before operating in the opposite nostril I had been upon this mixture and used it with such results as to render an operation on the left side unnecessary. After making one thorough application with the De Vilbiss atomizer, I found the mucous membrane blanched, the turbinate bones shrunken, the canal considerably increased in size and the discharge diminished. The patient experienced decided relief from the stenosis.

At another treatment, on introducing the Eustachian catheter through the nostril I had cauterized, its presence provoked a violent and protracted paroxysm of sneezing. This persisted so long that it was impracticable to insert the inner into the catheter. I managed to throw a spray of the camphor-menthol into the nostril retaining the catheter. At once the sneezing stopped and did not return, so that there was no further difficulty in injecting remedies into the middle ear.

That experience led me to try it in nervous catarrh. I had just received a letter from a hay fever sufferer in Tewksbury, describing his satisfactory experience with menthol and albolene inhalations which I had recommended last year. The relief obtained by him, Professor Lockwood and others, by the use of menthol, and the fact that the presence of camphor appeared to intensify the effects of menthol, made it reasonable to suppose that this combination would afford relief in hay fever.

The first case of hay fever in which I used it was one of the early form. A spray stronger than 10 per cent. of the mixture with 90 per cent. of lavoline, produced sneezing and temporary stenosis of the nostrils, followed the next day by increased freedom of respiration and a sense of great comfort. A 5 per cent. solution produced sneezing or stenosis, but, on the contrary, left the nasal passages patulous for several days.

Another patient, living in a suburban town, began using camphor-menthol combined with lavoline just before the usual time for her attacks began, and enjoyed immunity from the suffering by inhaling it two or three times a day. She is fortunately located, being surrounded with the fragrant vegetation of the country, and it speaks for the remedy that it was able to keep the hay fever at bay. The last time she came for treatment, she had been able to prevent the development of the paroxysms, although she had noticed occasionally some premonitory symptoms. She brought me some specimens of the ragweed in blossom, and notwithstanding that she at-

tributes her suffering every year to the pollen of this plant, she was free from its effects then.

One of my assistants, Dr. Hall, did not receive so much benefit from these inhalations. While they gave him temporary relief from sneezing and stenosis, the symptoms would return again in a short time. In this instance the remedy was less effective than in any other in which I have employed it, but he used a 24 per cent. solution in lavoline, which is too strong for sensitive noses.

However, it is not to be expected that any single inhalant will prove equally successful in all cases. And the pathology of the disease leads me to believe that no local medication alone will ever prove completely remedial in hay fever.

Within the past few days, ex-President Lockwood, of the United States Hay Fever Association, has written me as follows:

"You can safely say some very good things for the camphor-menthol spray and inhaler. For twelve years I have been driven to the White Mountains every summer on account of hay fever, and I am used to expect a serious relapse on my return home. Last year this relapse was very serious, and accompanied with severe asthma. This year I prepared the camphor and menthol, and I had no more than started from the Jefferson station when sneezing began, but I checked it at once with the inhaler. It was simply an ounce bottle, with wide neck and glass stopper. My use of it, and the comfort following, was noticed by some of my fellow sufferers, who understood well what it meant. A number of them used it freely, with pleasant results, and that little bottle was the good genius of the journey.

"The heat and dust made our return to the city the most uncomfortable in twelve years' experience, and yet, to the surprise of myself and friends with me, this was the first time of my getting through a return trip with no hay fever or asthma, and it was due to the camphor-menthol inhaling. In mild forms, or at an early stage of this malady, both spray and inhaler are very effective. Since my return home, the heat, humidity and dust-laden air have brought the malady on again in great force, but the camphor-menthol greatly ameliorates my suffering. During this incessant day and night asthma, the spray keeps the nasal passages open, and so far its help is grateful to the asthma."

I take this occasion to pay a tribute to Professor Lockwood's microscopical researches, and to his unceasing endeavors during the years of his presidency of the United States Hay Fever Association to direct its work along the lines of scientific investigations concerning the cause and cure of hay fever.

Dr. B., of Kansas, came to have me operate for opening up the nostril, and for ear treatment. It was impossible for him to breathe through the nostril, so greatly hypertrophied were the turbi-

nates. To pass the smallest Eustachian catheter was out of the question. I succeeded in getting the effect of a 25 per cent. solution in the anterior and posterior nares, with the result of opening the canal in one treatment sufficiently to afford nasal respiration and sufficient space for catheterization. Another treatment increased the freedom of respiration, and subsequent treatments maintained the patulous condition of the nostrils, thus obviating the necessity of any operation with the knife, saw or cautery.

While writing these observations, an old college classmate, Mr. H., of Hutchinson, entered my office, suffering from an attack of acute laryngitis. He was unable to speak aloud. I gave him two inhalations during the forenoon, first with a 5 per cent. solution, and later with the 10 per cent. The following morning his voice had returned with nearly the customary strength and smoothness. After one inhalation more, his voice became normal, and all symptoms of laryngitis vanished.

One of my assistants, Dr. Collins, restored his voice from an enforced whisper to a good speaking condition in twenty-four hours by treating an attack of laryngitis with the inhalations, varying in strength from 10 to 20 per cent.

In hypertrophic nasal catarrh, with excessive discharge, a 25 per cent. solution, *i. e.*, 12½ per cent. each of the camphor and menthol, and 75 per cent. of lavoline, has checked the discharge, given it a healthy character, and restored nasal respiration.

I have had four assistants conducting experiments parallel with mine. The experiences of two have been briefly referred to. One of the others, Dr. Davey, reports having obtained results corresponding to mine, and the fourth, Dr. Campbell, compares the action of camphor-menthol with that of cocaine, excepting the powerful anæsthetic effect of the latter.

The important point to be emphasized in the use of this, as well as other potent remedies, is the choice of the proper strength in adapting it to each individual case in order to secure the best results. In chronic hypertrophic rhinitis in a person of dull sensibilities, a 25 per cent. solution may be used with excellent effect; whereas, in the opposite extreme of temperament, in which the Schneiderian membrane is exquisitely hypersensitive, a first inhalation stronger than the 3, or 5, per cent. solution, may appear to act as an irritant.

I have injected a 10 per cent. preparation in lavoline into the Eustachian tube, which was closed so firmly that it was impossible to inflate the middle ear by the Valsalva or Politzer method, with the result of opening the tube so well that on the following day there was no difficulty in injecting remedies through it into the tympanic cavity. This has occurred repeatedly.

No ill results have followed the injection of and 10 per cent. solutions into the middle ear but in several cases of catarrhal affections of the cavity the hearing was improved and the hearing has felt clearer after the injections.

I have applied the full strength camphor-menthol to eczematous eruptions and found that it relieved the pruritus and reduced the swelling and redness. It had a similar effect in herpetic eruptions.

Finally, camphor-menthol contracts the capillary blood-vessels of the mucous membrane, reduces swelling, relieves pain and fullness of the head, or stenosis, arrests sneezing, checks excessive discharges and corrects perverted secretions.

70 State street, Chicago.

SHOULD PHYSICAL RESTRAINT BE USED IN THE TREATMENT OF THE INSANE.

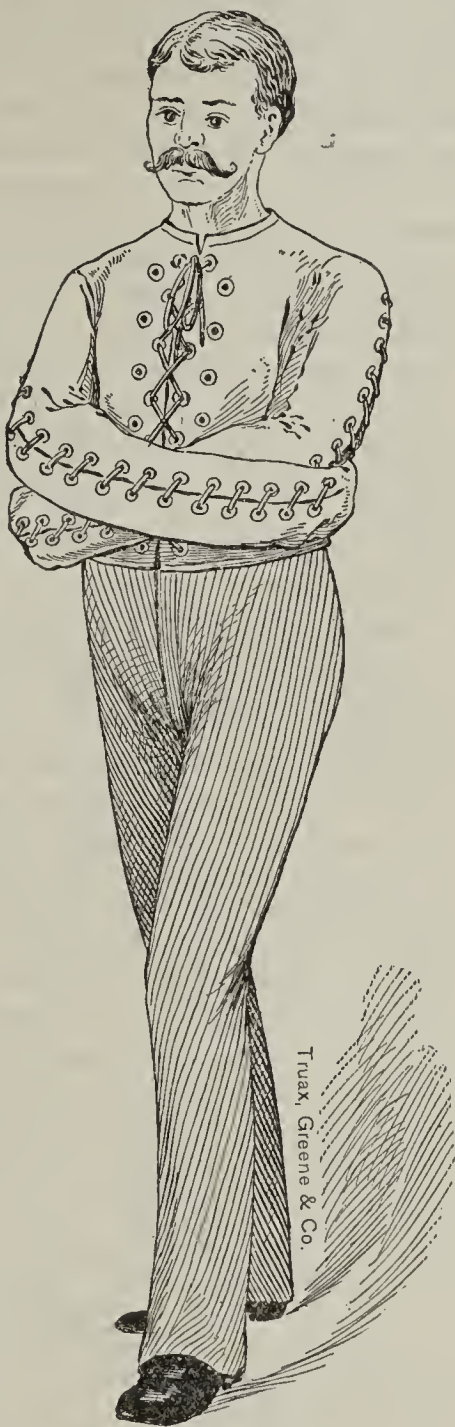
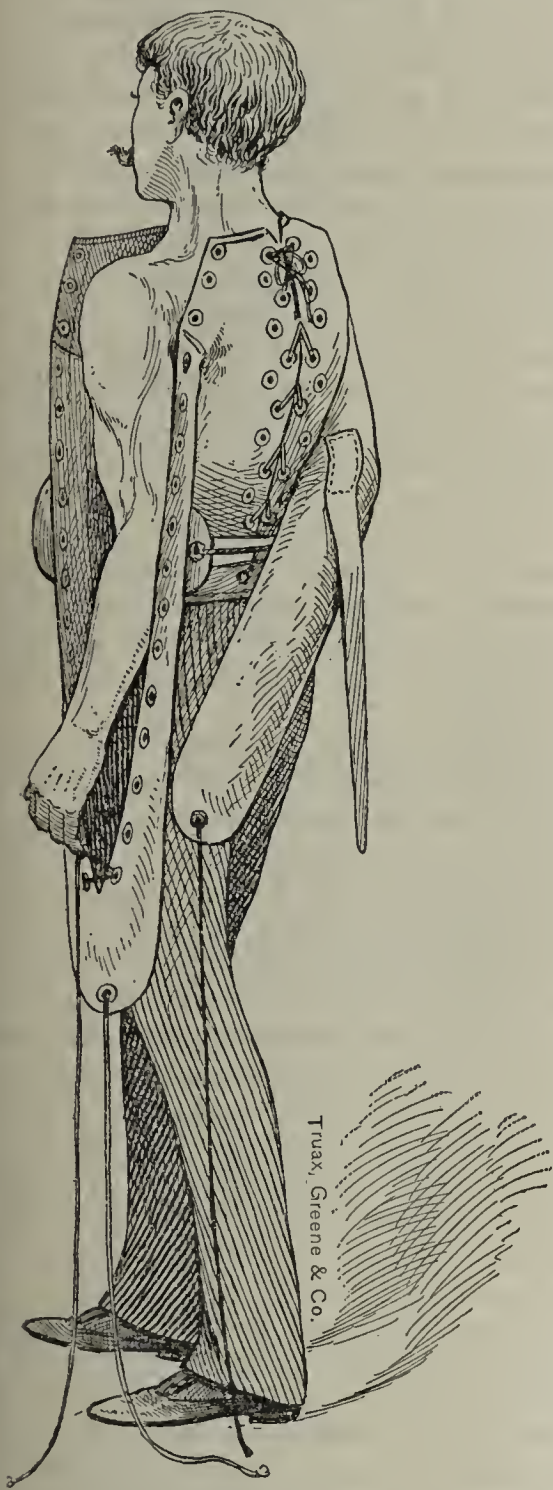
BY ARTHUR LOEWY, M.D.,

ASSISTANT PHYSICIAN COOK COUNTY HOSPITAL FOR THE INSANE.

A question important both to the physician in charge of the insane, and to the general public, is, "Shall physical restraint be used in the treatment of the insane?" This question has agitated the minds of officials in whose charge the insane have been placed, and has been for them a difficult problem to solve. I think that I may justly claim that those who have been intimately connected with this work will say that physical restraint, when properly and judiciously used, is a very important factor in the intelligent care and treatment of the insane. Physical restraint may be used for the following objects: First. To prevent the patient from injuring himself or herself. Second. To prevent the patient from injuring others. Third. When, for some bodily injury or ailment, it becomes necessary to apply restraint to secure proper action of some therapeutic reagent. Fourth. When patients remove their clothing. In those cases of insanity where there is a disposition on the part of the patient to injure him or herself, by thrusting the hand through window panes, by attempts of self-injury by throwing himself or herself on the floor, or by striking the head against the wall, or if the patient be suicidal, and make the most desperate attempts at self-destruction, the question arises, How shall we restrain this patient so that he may not injure himself, nor succeed in accomplishing that which is so dreaded in hospitals for the insane, namely: suicide? The general public, as a rule, holds up its hands in horror when some sensational report is circulated by the press, that patients in a given asylum have been seen who had their hands in restraint, some strapped to the bench—or even great

When it is said that a patient has been seen in a strait jacket. In all such cases as I have cited above, our first object must be to restrain the patient by carefully watching his every move, and prevent the carrying out of those designs of self-injury or self-destruction. But in doing this we must have a requisite number of attendants, so that no bodily injury be done in caring for him. In most of our public institutions we find so

that patient's mental condition. It is simply a means of protection to those patients who are in the same ward, and to those in whose charge this particular patient may be. In the treatment of any number of the insane, the care of each case has a bearing on every case in the same ward. Hence, to prevent injury to other patients, and oftentimes even to preserve their lives, restraint must be applied. For either of these conditions, namely: a patient attempting self-injury or injury



any patients of the class I have just depicted, that it is an utter impossibility to assign to this special duty a sufficient corps of attendants. It is under these circumstances that physical restraint is justifiable. If a patient attack other patients in the ward, he must be so restrained that he can do no injury to others; at the same time it must be taken into consideration that restraint in this case cannot be called beneficial to

to those about him, the following means of restraint suggest themselves: First. The patient is seated on a bench, a strap is fastened around the patient's waist and through the arm of the bench. Second. The wristlets. Third. Mittens and muff. Fourth. Strait jacket. Should a patient in a paroxysm of furor attack those about him, and other means having failed, physical restraint becomes necessary, I would give preference to the

first means. I have repeatedly seen, in my association in the care of the insane, patients rapidly become quiet and composed when fastened to the bench. Should, however, this fail to accomplish the end desired, namely: to prevent the patient from injuring him or herself or other patients, some other means must be employed. In such an event I should prefer wristlets, and following this the muff and mittens. For female patients, should the first means fail, the strait jacket, properly applied, is much more to be preferred. I have already stated that the care of one case has a bearing on all other cases in the same ward, and should we fail to use restraint when a patient attacks those about him, we may by this neglect cause direful results. A blow administered by one patient to another is as quickly returned, and the excitement of such an encounter will only add fuel to the fire, and patients heretofore quiet become maniacal and pugilistic. In all such cases, restraint must be used before injury, be it great or small, can be done. Seclusion of patients is to be deprecated; no patient, because he becomes maniacal, should be forced into a room and locked there until the furor has passed away. It is here that the acuteness of the insane may be manifested, and self-destruction be accomplished in a very short time.

The next condition in which physical restraint must be employed, is for the intelligent treatment of the insane when suffering from some bodily injury or ailment. A patient who has injured the upper extremities by thrusting them through window panes, or who has sustained an injury, as dislocation or fracture; or when local applications must be made, the patient resisting all attempts to properly care for him, restraint must then be applied. The question which then presents itself is, "What kind of restraint shall we use under these conditions?" If splints have been applied to the arm, wristlets, mittens or the muff are useless, because in their application there would be great danger of shutting off the blood supply. Again, if the injury were one of the hand, it would be impracticable. Again, the old strait jacket is impracticable, because we could not watch the circulation, and if frequent changes of dressing were necessary, it would be a hindrance to proper treatment. To replace all modes of restraint in this class of patients, I have made improvements and additions to the old strait jacket, a cut of which is herewith shown.

The Benson Strait Jacket, as this is known, consists in having an opening in the front corresponding to the one in the back, and further, an opening in the sleeve from the neck to the tips of the fingers. By means of this jacket, a patient being confined to bed with some ailment requiring constant use of poultices, the poultices can be changed without raising the patient to the sitting posture, as must be done when the old

jacket is used, thereby avoiding the dangers of death from heart failure. The opening in the sleeve permits the physician to have knowledge at all times as to the condition of the injured member, and should swelling ensue after the application of a splint or cast, immediate knowledge can be had of the fact. An attachment is placed at the elbow, which is brought around the back and fastened to the cord at the tip of the fingers, thereby permitting each arm to be put in restraint separately. Thus we may place less tension on the injured arm than we would on the uninjured one. In the old jacket, each arm when in restraint has equal tension on it. I desire here to call attention to the fact that, when the jacket must be used as under the first and second conditions cited, it will be found that if the arms are tightly drawn, they are thus placed in an unnatural position, and pain is the result. If, though, this attachment placed at the elbow be brought around and tied to the cord at the tips of the fingers, the arms will be placed in a natural and comfortable position, as may be seen in the figure before alluded to. The fourth condition where physical restraint is justifiable, is where the patient removes his clothing. For the prevention of this object, we may use all the restraint I have already cited, the kind of restraint being wholly governed by the mental and physical condition of the patient.

For the maniacal we must use the jacket, the muff, mittens or wristlets. For cases, though, of melancholia or dementia, where the patient attempts the removal of clothing, I have devised a canvas wristlet, made thus: A piece of canvas is taken, somewhat larger than the size of the wrist. Parallel with the longest side of the cloth two oblong openings are made. The loops are then cut in this same piece to fit in the opening made before, and through these loops a belt is drawn, and fastened in the back. The advantages of this canvas wristlet are these: First. There is less idea of restraint in their use, and they cannot injure the patient. Second. They can readily and easily be made. Third. Cheapness in construction.

I have thus laid down the four conditions under which I hold physical restraint to be justifiable. Never, I hold, should restraint be used as a punishment for misconduct. Never after a patient has done what he should not, but to prevent him from doing that which tends to his own disadvantage, and which prevents or postpones the recovery of his mental health, or for the safety of others, should restraint be applied.

PROF. JOHN J. REESE has resigned the chair he has so long filled in the University of Pennsylvania. His successor has not yet been appointed.

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SATURDAY, OCTOBER 24, 1891.

SYPHILITIC SPONDYLITIS IN CHILDREN.

At the recent meeting of the American Ortho-
dic Association, DR. JOHN RIDLON, of New
rk, read a paper with the above title.¹ He
s "syphilitic spondylitis differs in no way
m syphilitic joint disease located elsewhere,
cept as it is modified by its peculiar surround-
gs. In the superficial joints, where the infil-
tion of the soft parts and bone can be readily
n and felt, the onset of the disease is very
w, and months may pass before pain is com-
ined of or disability become serious; but in
spine, where the lesion is located in and
out the anterior surface of the vertebral bodies,
beyond sight and touch, the slow advance of
early symptoms escapes recognition and the
et usually appears to be comparatively rapid.
any motion the distant pain is complained of,
sometimes within a few days the patient is un-
e to stand without support. If located in the
sal region, the kyphosis soon appears with a
rp angle, formed of but one or two spinous
cesses, and with a long sweeping curve above
below. In the lumbar region, the kyphosis
slow to appear, often not appearing until
ked psoas-contraction can be made out, and
haps not until an abscess has formed; but lor-
s is an early and well-marked symptom."

¹Med. News, Vol. LIX, p. 453.

The description certainly affords no clue to the
differentiation of this supposed syphilitic disease
and the common tubercular joint, and the author
admits that his earlier efforts to establish this dis-
ease met with so much resistance at the hands of
his colleagues that he did not even publish his
original paper, written some five years ago.
Moreover, his cases, when examined, were pro-
nounced by others to be tubercular. Neverthe-
less, he still feels convinced that syphilitic dis-
ease of joints, closely resembling the tubercular
disease, does exist. He claims that the syphi-
litic disease shows a tendency, like syphilis else-
where, to hyperplasia rather than to molecular
disintegration.

The diagnosis is made chiefly upon the detec-
tion of syphilis in the parents or grandparents,
and upon the presence of other syphilitic lesions
in the child. RIDLON calls particular attention
to the age of the child, and expresses himself as
believing that in children under three years of
age spondylitis, associated with chronic disease
of some other joint, or in another portion of the
spine separated by a healthy area, is more fre-
quently syphilitic than tuberculous.

In this connection it is interesting to recall the
observations of FOURNIER on late manifestations
of hereditary syphilis, particularly the bony le-
sions. FOURNIER describes these lesions under
three forms,—osteo-periostitis, gummy osteo-per-
iostitis, and gummy osteo-mylitis. The first of
these is probably closely connected with the con-
ditions described by DR. RIDLON. Syphilis cer-
tainly by preference attacks the epiphyses of the
bones. In the case of the lower end of the fe-
mur this may certainly very closely resemble dis-
ease of the joint. However, according to FOUR-
NIER, the tibia is the bone most frequently at-
tacked in late syphilis, and following this the
radius and humerus.

By way of treatment RIDLON makes use of
both mechanical and medicinal means. He finds
rest in bed preferable to braces as a rule. Inter-
nally he uses mercury and iodine in large doses.
If the stomach will tolerate it, one-thirtieth to
one-twenty-fourth of a grain of the bichloride or
biniodide, is given with five to forty grains of
potassium iodide three times a day.

Whether DR. RIDLON be correct or not, he
certainly has obtained some good results in treat-
ment, and it is always wise in medicine to ques-

tion a single cause which is credited with being always responsible for a certain morphological lesion.

WAVES OF ZYMOTIC INFLUENCE.

At irregular periods we are called upon to chronicle the passage over our country of a contaminating, epidemic influence that manifests itself at various points with more or less virulence. In some localities the wave seems to be but a gentle breeze, as shown in an outbreak of scarlet fever attacking very many children, but easy of management, and followed by few, if any, deaths. Another locality develops a focus of diphtheria that has in it all the characteristics of a veritable cyclone. Those who are stricken with the disease, are so overwhelmed with the poison as to be at once clasped in the arms of the grim monster, and in spite of all known remedial measures the victims quickly succumb to his fatal embrace.

The present season will be remembered as one of extended epidemic influence, in which every considerable centre of population has suffered to some extent from the blow; and while the Nation rejoices in the season's most bountiful yield of the earth's fatness, very many communities are stricken and in mourning because of the zymotic wave that is passing over the land.

A mournful thought in this connection is in reference to the fact that in nearly every instance the effects of this pervading influence might have been ameliorated, by a recognition and enforcement of known sanitary laws.

Small-pox has been literally driven from our country's bounds. Absolute isolation of first cases will stop threatened epidemics of scarlet fever and measles. Typhoid, whether produced by a microbe or a ptomaine, is preventable by a removal of the cause of the infectious poison. This poison is known to be most frequently taken into the system through the drinking of polluted water or contaminated milk.

As the country and cities become more and more densely populated the danger from these sources increases, thus making a continuous demand upon physicians and health authorities for a never ceasing vigilance.

A most important duty is the education of the people, and particularly the youth who are in school, in regard to the causes of infectious diseases and their prevention.

Diphtheria is very prevalent in a neighboring city (South Bend, Ind.). This disease is known to be propagated not only by direct contagion, but indirectly through the inhalation of a poisoned or contaminated atmosphere. The unsanitary conditions of the city referred to are such as to continue the influences of the infectious disease that is carrying many of its children to an untimely grave.

At considerable expense the streets have been sewerred, but singular as it may appear, the council persistently neglect or refuse to compel householders to make proper connections therewith.

In the city of Chicago there were more than 20 deaths last month from typhoid fever, which would indicate not less than 2,000 cases in the city at that time, nearly every one of which was produced either by drinking the lake water without sterilizing by boiling, or by the use of milk in a similar manner.

The health authorities of every city should exercise the greatest care in seeing that dairy cows are provided with a sufficient supply of pure water. Two hundred deaths a year is quite a severe penalty for any city to pay for neglect in obtaining a potable water supply, but when the tally runs up two hundred deaths per month, such a wail should go up to the powers that be, to permit neither sleep nor rest from superhuman efforts to right the wrong that exists. The question is not so much one of financial cost as one of life and health.

We are glad to know that the physicians of the city are fully alive to the importance of this momentous subject. Concerted action on the part of the medical profession would have a wonderful influence in forwarding the work of the Water Works Board and Drainage Commission.

TYPHOID FEVER.

The subject of typhoid fever was considered at the Chicago Medical Society, on the evening of the 21st inst. Four papers were presented, and the three hours session proved to be of great interest. The opening paper by Dr. N. S. Davis, Jr., on the "Etiology of Typhoid Fever," was confined to the discussion of the subject as developed during the last eighteen months. He paid full and careful attention both to those who

ated the causative agency of the KOCH-EBERTH bacillus, and those who doubted it. Maintaining, himself, to the view that the weight of the argument is in favor of the KOCH-EBERTH bacillus, he gave very full expression to the views of VAUGHAN that typhoid fever is not a specific disease, but a group of diseases caused by a variety of poisons. VAUGHAN considers that it is essentially a filth disease, arising under conditions resembling in general those concerned in the production of cholera infantum. In the discussion VAUGHAN'S work in the production of pseudo-typhoid bacilli was brought out. By rejecting certain microorganisms found in drinking water, to continuous high temperature, resembling that met with in typhoid fever, VAUGHAN has found that they lose their original properties and acquire the peculiarities heretofore supposed to be distinctive of the KOCH-EBERTH bacillus, viz., a resistance to stains, and the formation of an invisible growth on potato. RODET and ROUX by similarly treating the *bacterium commune*, find that it likewise acquires these properties. On these grounds it is urged that the means of recognizing the KOCH-EBERTH bacillus being uncertain, the views which have already been expressed regarding it, based on the mode of recognition, must be held in abeyance. Quite recently this matter was reviewed somewhat fully in these columns.

The "Complications of Typhoid Fever" were discussed by DR. JOHN H. CHEW, and the "Treatment of Typhoid Fever" was the subject of DR. WILLIAM E. QUINE'S paper. DR. QUINE paid particular attention to the subject of the temperature, and made a strong plea for the temperature as the leading symptom in typhoid, and as the principal index for treatment. The excellent effects of the systematic use of the cold bath were strongly presented, and the reason of their being laid to the door of temperature reduction. He does not advocate, however, the indiscriminate use of the baths in all cases, as is urged by the extreme advocates in Germany, and admits that they favored the occurrence of relapse. He also urged a discriminating use of the moderate antipyretics, but discouraged their prolonged employment.

The concluding paper of the evening was by WELLS VAN HOOK, on "Laparotomy in Perforation in Typhoid Fever, and Report of a

Successful Case." In DR. VAN HOOK'S case the perforation occurred during the second week of the disease, and the operation was made about four hours after the accident. He made a small incision in the median line, and found the perforation quite readily. Discarding trimming the edges of the wound as unnecessary and as consuming valuable time, he closed the opening by three rows of LEMBERT sutures. Regarding the perforation as probably the only one, no further examination of the bowel was made, but the wound immediately closed after a proper *toilette* of the peritoneum. The fever continued its usual course for two weeks longer, and the patient made a complete recovery.

This is Dr. VAN HOOK'S third laparotomy for perforation in typhoid, and his first successful case. In reviewing the literature of the subject, Dr. VAN HOOK found that altogether there have been nineteen laparotomies performed for this condition with four recoveries. In some of these cases, however, the diagnosis is doubtful, typhoid not being positively distinguished from appendicitis. Rejecting the doubtful cases, the statistics show twelve laparotomies with one recovery.

To Dr. VAN HOOK, then, belongs the honor of the first undoubted successful operation for typhoid perforation.

ETHYLENE BROMIDE IN EPILEPSY.

DONATH has given in the *Therapeutische Monatshefte*, some considerations favorable to the adoption of the above named drug as a substitute for potassium bromide, in those cases where the latter cannot be continuously used without occasioning disagreeable symptoms, which troubles are for the most part chargeable to the potassium in DONATH'S opinion. He therefore sought for a bromine preparation in which the action of the latter would be highly accentuated and at the same time more pleasant than in the combinations that have hitherto been chiefly employed. Accordingly he has tried ethylene bromide in ten cases for several months, and is enabled to report that in all these cases, he regards the action of his new remedy as more happy than the potassium salt. The greater number of these cases had been of long standing and some of them had for years been under the influence of potassium bromide. Under the ethylene

these cases have shown an improved condition for the present; the convulsions have been diminished in force and reduced in frequency. In some, the convulsions are brought to a point where it is proper to describe them as mere muscular contractions with the customary loss of consciousness. Fifteen other cases have been under treatment a shorter period of time, too short, in fact, to warrant any declarations as to their improvement. DONATH recommends the following prescription: R. Ethylene bromide, spirits of wine, āā 32 minims, oil of peppermint, 2 minims. Dose: Five to fifteen drops three times daily. This dose may be raised to seventy drops, two or three times daily, for adults; or as high as twenty drops for children. It should be borne in mind that one minim of the ethylene is equal to two drops. The taste of the drug is sweetish at first, but afterwards leaves a burning impression. Its odor reminds one of chloroform. It is soluble in water and milk, and miscible with alcohol or oil. Its administration may also be effected by capsules containing three or four drops of the drug mixed with six drops of the oil of bitter almonds. This drug should not be confused with bromide of ethyl, which has been used to some extent during the past year as an anæsthetic.

EDITORIAL NOTES.

MR. J. HARRISON WHITE, the former business manager of this JOURNAL, is in no way connected with its management, and has no authority to make any statements in regard to its present conduct or affairs.

DR. THOMAS F. WOOD.—Dr. Wood, of Wilmington, N. C., has been chosen to succeed himself, in the Board of Health of his State, as Secretary and Treasurer for a term of six years. He is one of the representatives of the State Medical Society, duly elected by ballot at the last joint session of State Society and State Health Board.

LARYNGEAL TASTE.—Michelson has made, under Langendorff's direction, some careful experiments as to the distribution of the nerves of taste to the under or inner side of the epiglottis, and the results have been published in Virchow's

Archiv. The presence of the end organs, the taste bulbs, have been frequently noted, but the demonstration of a recognition of sapid substances has first been clearly made by Michelson. His tests were conclusive, with control experiments by electrical contact, the "electrical taste" so that it may be accepted as proved that the nerves of taste have in part a laryngeal distribution.

MEDICAL POPULATION OF CANADA.—The *Montreal Medical Journal*, quotes the following as correct estimate of the number of practitioners in the Dominion, arranged by provinces:

Ontario	2,300
Quebec	1,100
New Brunswick	170
Nova Scotia	300
Prince Edward Island	60
Manitoba	140
Northwest Territory	50
British Columbia	60
Total	4,180

AN INCOMPATIBLE OF SODIUM BROMIDE.—According to the *Medical Press*, the following compatibility has been pointed out: When solution of sodium bromide and cocaine hydrochlorate are mixed the alkaloid is precipitated. The writer adds: "It will be well to bear this in mind for with the cocaine merely suspended a serious and, in an infant, even a fatal accident might easily result."

SOCIETY PROCEEDINGS.

American Dermatological Association

The Fifteenth Annual Meeting was held in Washington, September 22 to 25, 1891, in conjunction with the Congress of American Physicians and Surgeons.

The meeting was called to order by Dr. F. B. Greenough, of Boston, who made the opening address.

The Report of the Committee on Nomenclature was made and after discussion was accepted.

The first paper read was by Dr. H. G. Kligler, of New York, entitled "Dermatitis Hæmostatica." It was discussed by Drs. Piffard and Bronson.

Dr. L. A. Duhring, of Philadelphia, followed with a paper, "Report of a Case of Univeral Erythema Multiforme." It was accompanied by a colored portrait of the case and specimens on large plates of exfoliated epidermis shed by the patient during the latter part of the course of the disease. It was discussed by Drs. Hyde, I.

g, Sherwell, Shepherd, Fox, Allen and Bronson. Dr. Shepherd asked if any drug had been administered for the rheumatism that was a marked feature in the case, to which Dr. Duhring replied, "No! The treatment had been entirely negative." Dr. Fox had seen a case somewhat resembling that of Dr. Duhring in which there is a question if the eruption had been caused by some drug that had been taken for a coëxisting gonorrhœa. He thought that it was a purely accidental occurrence. We often see cases of dermatitis exfoliation following other diseases, such as psoriasis.

Dr. Shepherd, of Montreal, then read a paper on "An Unusual Case of Sarcoma involving the Skin of the Arm, requiring Amputation." This was followed by a paper by Dr. S. Sherwell, upon "Multiple Sarcomata. History of a Case Showing Modification and Amelioration of Symptoms with large Doses of Arsenic." In the discussion Dr. Zeisler mentioned brilliant results in a case of lupus sarcoma for the administration of arsenic. In a case of pigmentary sarcoma he had given the drug without effect. Dr. J. C. White, of Boston, had seen good effects from use of the drug in one case of sarcoma. Dr. Robinson, of New York, had not had much success with arsenic. He believed that many cases of multiple sarcoma were in reality microbean in origin and not true tumors.

The next paper read was by Dr. R. B. Morison, of Baltimore, on "The Hypodermic Use of Hydragryrum Formamidatum in Syphilis," which he recommended as a treatment of great usefulness, especially as a means to fall back upon in those cases in which older forms of treatment did not succeed, or in which such a plan as that of Merck's preparation and found that it did not cause much pain nor prove objectionable. He had never used any of the insoluble salts. In the discussion Dr. Corlett said that he had found hypodermic injections of mercury of great use in some cases, such as in those cases in which the machi has given out. Dr. Klotz had employed hypodermic injections in syphilis. While it was doubtless of value in some cases, for most cases other methods of treatment are quite as good. Dr. Greenough said that while greatly interested in the subject of hypodermic medication in syphilis, he had found it impossible to get his patients to submit to it. He thought it was useful only in exceptional cases in which other plans could not be used. Its ultimate result was no better than that of other plans.

Dr. J. Grindon, of St. Louis, read a paper upon "Eichen Scrofulosorum," which gave rise to a long discussion. Drs. Robinson, Piffard, Sherwell, Shepherd, Corlett, Bronson and Greenough had seen cases of this rare disease.

Dr. Sherwell, of Brooklyn, read a paper on

MULTIPLE SARCOMATA OF SKIN.

History of a case showing modification and amelioration of symptoms with large doses of arsenic.

The author, after pointing out numerically several interesting points, chief among which were, largeness of therapeutic dosage, tolerance of them by patient, complete and rapid subsidence of tumors under such dosage, rapid recurrence under suspension of same, originality of treatment instituted, etc., goes on to give a history of the patient with sarcomata, supplemented with a further history by Dr. John B. Wheeler, of Burlington, Va.

Dr. Sherwell removed in all, from this patient, thirty growths, some of which were quite large, one $3\frac{1}{4}$ inches in diameter; Dr. Wheeler about a year later in a series of operations removed the immense number of one hundred and seventy (170) large and small. In the interval between his leaving Dr. Sherwell's care and coming under that of Dr. Wheeler, he had interrupted or almost suspended treatment spoken of above, which had at the time of his leaving Dr. Sherwell caused the complete or almost complete disappearance of all growth. They recurred too rapidly for Dr. Wheeler to operate, when Dr. Wheeler adopted same internal treatment as that which Dr. Sherwell had instituted with the most decided and gratifying results, namely, the same rapid disappearance of the growths. The case ended by his leaving Dr. Wheeler's care in good condition and doing exceedingly well, irregularity or total interruption of treatment, and as before recurrences of growths, followed in a few months by death.

SECOND DAY—THURSDAY, SEPT. 23.

The Committee on Statistics made its report through its Chairman, Dr. J. H. Hyde, of Chicago.

This was followed by a discussion on "Tuberculosis of the Skin," which was opened by Dr. J. C. White, of Boston, who presented "Its Clinical Aspects and Relations;" by Dr. J. T. Bowen, of Boston, who presented "Its Pathology;" and by Dr. G. H. Fox, of New York, who presented "Its Treatment." In the discussion Dr. H. G. Piffard drew attention to the fact that French and other competent observers had surmised the connection between what was then called pulmonary consumption and lupus and the so called scrofuladermata. He had done so in 1878. Recent invention of the Abbe condenser and Zeiss lenses had enabled us to discover the tubercle bacillus, and to establish the relationship on pathological grounds. He himself believes that lupus erythematosus is fully entitled to the name "lupus," as he thinks that it, too, is of bacillary origin. Nor is he alone in his opinion. Cold abscess of the skin is probably due to the same cause, as is

also rodent ulcer. He would agree with Dr. White in believing that we should have some collective term for all the various tubercular diseases. In treatment he would advocate cutting out the whole diseased patch, unless it was very extensive. Next to the knife he would place the actual cautery after removal as much as possible of the growth with the curette. Arsenic and chloride of zinc are also to be depended on.

Dr. C. W. Allen commended multiple scarification, and combined pyrogallol and mercurial plasters; he thought that there might yet be a future for Koch's tuberculin.

Dr. J. Zeisler was in thorough accord with Dr. White. By his experience at the Hospital, St. Louis, he had become converted to the use of the galvano-cautery. He would also testify to the efficacy of the solid nitrate of silver stick which, bored into the skin, would act both as a knife and caustic. He was not enthusiastic as to tuberculin.

Dr. E. B. Bronson believed that it was best to retain for some time our present terminology for the different tubercular diseases. In regard to tuberculin, he had seen improvement in some cases treated with it, but on the whole his experience had made him regard the remedy unfavorably. He had had good success with the dental burr, as first advocated by Dr. G. H. Fox. The nitrate of silver stick was also good.

Dr. J. N. Hyde was glad that Dr. White had come to accept local contagion as the cause of lupus, a view that he himself was among the first to advocate. He thought that in this country there were but few cases of lupus with a history of pulmonary tuberculosis in the family, or with tubercular diseases elsewhere. He did not believe in the treatment by scarification. Both the curette and nitrate of silver were serviceable in proper cases. In regard to tuberculin, he thought it possible that in time we might find something of value in it, but it was not so now.

Dr. L. A. Duhring would retain the old names for some time to come. He had not found lupus associated with general tuberculosis in private practice. He would recommend pyrogallol most highly, using it in the form of a plaster, with resin and soap plaster, three of the resin plaster and one of the soap plaster. This is to be worn continuously. Local use of bichloride of mercury he had not found beneficial. Tuberculin he had found helpful, though he did not report any case of cure.

Dr. P. A. Morrow would agree with Dr. White that as lupus and some other diseases had a common etiological factor, we should place them together under a common heading. He advocated the use of multiple scarifications, followed by mercurial plaster. For destruction of the small lupus nodules he recommended punctate cauterization with a white hot instrument. Chloride

of zinc was superior to pyrogallol as a caustic. Excision will probably increase in favor as the means of treating lupus.

Dr. A. R. Robinson would not include lupus under a common heading with tuberculosis on account of its different clinical aspect.

Dr. H. G. Klotz was not yet satisfied with our present knowledge of the infection of the skin with the bacillus tuberculosis.

Dr. L. D. Bulkley is not satisfied with any of the plans for the external treatment of lupus. Internally he has great faith in phosphorus as a curative agent, the nodules softening up and disappearing under its continuous use. He would corroborate Dr. Fox's advocacy of fuchsin. As to pyrogallol, that, too, was admirable. He applies it in powder form, pure, after scraping. Salicylic acid, combined with pyrogallol, is also useful.

Dr. S. Sherwell was doubtful of the relationship of tuberculosis to lupus.

THIRD DAY, FRIDAY, SEPT. 24.

Dr. Duhring read a paper upon "Notes of a visit to the Leper Hospital of San Remo, Italy." In reply to a question by Dr. White, after the paper was read, he replied that no attempt at segregation was made in San Remo. There were but few cases in the hospital and they were in an ordinary ward of a general hospital. They were not permitted to leave the confines of the hospital.

Dr. P. A. Morrow, of New York, then followed with a paper on "Skin Grafting," and showed a case in which the operation had been done by the method described by him and with admirable results.

In the discussion of the case Dr. Duhring spoke in high praise of the operation of skin grafting as practiced by Dr. Jas. E. Garrettson. Dr. Clarke asked if Dr. Morrow thought that the inclusion in the graft of the deeper structures of the skin, as recommended by him, would give any better results than more superficial ones. To this Dr. Morrow replied that he thought they would be more certain to take, and he had had not a single failure. He had made more than fifty grafts of hairy skin upon a cicatricially bald scalp, and all of them had taken, and from many of them the hair was growing nicely. Dr. Sherwell had had good results, also, by deep grafts.

Dr. P. A. Morrow, of New York, then read a paper on "The Treatment of Alopecia Areata," and was followed by Dr. L. D. Bulkley, of New York, with a paper on "A Therapeutic Note on Alopecia Areata." The two papers were discussed together. Dr. L. Zeisler believed alopecia areata was due to a parasite, though perhaps there were some cases due to a neurosis. The latter were the very obstinate ones. He was in favor of treating all cases by epilation about the

atches. With pilocarpine he had had no success. He regarded the use of a concentrated solution of common salt as a good remedy for stimulating hair growth.

Dr. W. T. Corlett spoke in favor of acetic acid as a remedy in alopecia areata. Cases, however, recovered spontaneously.

Dr. G. H. Fox was always pleased to hear anyone speak with confidence of any treatment of alopecia areata, as Dr. Bulkley had done of carbolic acid. He was rather skeptical of any remedy. A strong solution of ammonia had proved as effective as any in his hands. He thought that general treatment of the patient was quite as important as any local application. Dr. J. E. Graham had never seen any cases that would lead him to believe that alopecia areata was contagious. He did not think that because antiparasitic remedies were useful, that this was a proof of the parasitic nature of the disease. Dr. P. A. Morrow thought that there had been a sufficient number of cases of contagion reported to satisfy any reasonable doubt of the contagiousness of the disease. He quoted Eichhoff's report, in which a number of cases were traced to one barber. He had had one case of probable contagion.

Dr. L. A. Duhring said that in spite of a great deal of study of alopecia areata he had never been able to find any parasite in the disease, nor to be convinced that the disease was contagious. He believed that there was a disease simulating alopecia areata, and often reported as such, that sometimes occurred epidemically, but was not alopecia areata. He regarded arsenic taken internally as very valuable in the treatment of the disease. He could see no reason for depilating the healthy hair about the patches.

Dr. J. C. White said that we were still wanting positive evidence of both the parasitic and the neurotic element in the etiology of the disease. Clinical evidence points both ways. He had seen cases of apparent contagion. He had seen 30 cases of a disease simulating alopecia areata, and that were not cases of ring worm, occurring in an asylum, which probably were instances of the so-called contagious alopecia areata. He did not think that they were true alopecia areata.

His favorite remedy was half a drachm of croton oil to eight ounces of turpentine used daily. Of course it failed in some cases, as do all remedies. If it failed he used many other remedies that had been commended, but they did not do any better. He did not believe there was any specific remedy.

Dr. H. W. Stelwagon had never been able to trace a case to a contagious origin. Local stimulation is more to be relied on in treatment. He was fond of equal parts of turpentine, cantharides and tincture of capsicum, with arsenic internally.

Dr. J. N. Hyde believed that the time would come when alopecia areata would be regarded as a symptom. Some cases were doubtless parasitic and some neuritic in origin. In bad cases he used creosote locally. After say the 45th to 48th year of life the chances of recovery were greatly decreased.

Dr. H. G. Klotz had had one case in which hereditary syphilis was probably the underlying cause, the boy getting better when under specific treatment.

Dr. C. W. Allen believed that the disease was parasitic and thought that he had in his own practice observed a case of contagion. He thought that internal treatment was valuable. Naphthol and pefrogallal had both proved useful in his hands.

Dr. S. Sherwell believed the disease to be of neuritic origin alone. Stimulation was most to be depended on.

Dr. J. Grindon had never met with a case that suggested either a parasitic or contagious origin of the disease.

Dr. F. B. Greenough used in practice a half drachm of carbolic acid in an ounce of water.

Dr. L. D. Bulkley in reply to a question of Dr. Morrow, said that he used the 95 per cent. solution of carbolic acid only to a small portion of the scalp at a time. It should be brushed over lightly at first so as to benumb sensibility and then rubbed in more thoroughly. He had not used it elsewhere than on the scalp. The skin is red for a few weeks; this disappears and the hair grows. He also administers strychnia and phosphoric acid, and keeps up the nutrition of the patient.

Dr. R. W. Taylor, of New York, read an account of a case of "Angioma Pigmentosum of Atrophicum," by Dr. A. W. Brayton of Indianapolis. It was accompanied by an excellent portrait.

Dr. J. C. White stated that his investigations showed that the disease was not limited to Russian Jews, but was met with also in persons of English and French descent.

Dr. Bronson then read his paper upon "The Etiology of Pruritus."

THIRD DAY, AFTERNOON SESSION.

It began with a short discussion of Dr. Bronson's paper on "Pruritus," in which Drs. Zeisler and Morrow took part, the discussion being closed by Dr. Brown Bronson. Dr. W. T. Corlett, of Cleveland, then read a paper upon "Diseases of the Skin, Associated with Derangement of the Nervous System." It was discussed by Drs. Bronson, White, Fox, Duhring, Zeisler, Allen and Sherwell, who took various views of the cases reported, all agreeing that it was very difficult to diagnose what the cases were without having seen them.

Dr. L. A. Duhring read his paper entitled "Experiences in the Treatment of Chronic Ringworm in an Institution for Boys." He recited the many remedies he had used. In the discussion Dr. G. H. Fox said that Dr. Duhring's experience was both interesting and valuable. He had had considerable experience in the New York Skin and Cancer Hospital. He had found chrysarobin useful, as had Dr. Duhring. He began the treatment by clipping the hair short, and shaving, either only over the patches or over the whole scalp and applying chrysarobin in traumatization. He was tired of greasy applications. Hydronaphthol plaster, as recommended by an European physician, had proved more satisfactory than chrysarobin. He advocated epilation where practicable.

Dr. J. Zeisler advocated pyrogallol as a parasiticide. Dr. Duhring, in reply to a question, said that some of the cases recovered in six weeks, and some not for a year. Dr. White thought that while chrysarobin was a good remedy, it was not a safe one to use outside of an asylum or hospital. He recommended a combination of sulphur, carbolic acid, and naphthol in ointment form. Dr. Stelwagon recommended an ointment composed of tar, sulphur, and citrine ointment. Dr. Sherwell advised keeping the scalp saturated with a mild oil and covered with a skull cap. Dr. E. Wigglesworth believed that it is necessary for us to have regard to the nutrition of our patients. Dr. C. W. Allen bore testimony to the value of chrysarobin. Dr. L. A. Duhring, in concluding, said that the cases were all well when he left off treatment, and that they remained well for at least one year. Epilation he found did not repay the vast amount of labor it cost. He regarded ointments as most useful remedies.

Dr. J. Zeisler, of Chicago, then read his paper on "Epilation; its Range of Usefulness as a Dermato-therapeutic Measure." In the discussion, Dr. G. H. Fox said that he was glad to hear any one advocate epilation in sycosis, as he had found it a most useful remedy. A sulphur paste after epilation is valuable. He had not found epilation so promptly curative as had Dr. Zeisler, while he laid more stress on diathetic management than did the latter. He was sure that epilation was useful in some cases of chronic ringworm of the scalp. Dr. H. G. Klotz spoke also in favor of epilation in sycosis, though he had cured many cases without it, notably with mild naphthol ointments. He thought epilation to be valuable in syphilitic lesions about the hairs, as well as in all the pustular affections implicating the hair. Dr. L. A. Duhring had not been able to practice epilation on his patients on account of the pain it caused, specially on the upper lip. He could not see much use in epilating in alopecia areata when the hairs were firm about the

patch. Dr. P. A. Morrow said that he did not think that it was necessary to pull out all the hairs about the bald patches, but it was a good thing to make traction on all of them and to remove all that were loose. Epilation was a requisite in all rebellious cases of trichophytoses. If the hair is removed by a quick sudden movement, the operation is nearly painless. Dr. H. W. Stelwagon believed that many cases of sycosis could be cured without epilation. He would speak in special praise of Fleming's solution in trichophytosis, diluting it at first one part to five or six of water, and gradually increasing the strength to just short of marked irritation. Dr. S. Sherwell spoke of the connection between catarrhal conditions of the nose and sycosis of the upper lip. Dr. J. N. Hyde said that the last time he was in London and Paris he had observed that epilation was quite generally practiced about the patches of alopecia areata. In closing Dr. Zeisler said that when epilation was properly performed it was almost painless. As he regards alopecia as a parasitic disease spreading at the periphery he epilated about the patches to prevent their spreading.

FOURTH DAY—MORNING SESSION.

The first paper was by Dr. J. E. Graham, upon "Molluscum Contagiosum." Dr. Bowen said that there was little question but that the disease was contagious. It is still unproven whether certain bodies found in molluscum are or are not coccidial. Dr. Allen had no doubt about the contagiousness of the disease, and related cases of the disease spreading in an asylum from one case. Excision is never necessary. They can readily be squeezed out, and then lightly touched with a caustic. He believed in their parasitic origin. Dr. E. Wigglesworth likewise cited a case of contagion. Dr. J. C. White, while believing that molluscum was contagious, was not prepared to accept the psorosperm as its cause. Dr. J. N. Hyde pointed out that in the statistics for the year just closed, seventeen cases of molluscum contagiosum were reported, viz.: nine from Boston, five from New York, two from Chicago, and one from St. Louis. Dr. F. B. Greenough believed them to be contagious. In treatment he simply bores them out with nitrate of silver stick. Dr. S. Sherwell concurred in the belief of their contagion. Dr. J. E. Graham thought, from evidence so far brought forward, that the so-called psorosperms were simply degenerated epithelial cells.

Dr. J. N. Hyde, of Chicago, then read his paper, "Note Relative to Pemphigus Vegetans." In the discussion, Dr. L. A. Duhring said that he had had the opportunity of seeing the case described, and would corroborate what Dr. Hyde had said of it. It certainly was more of the nature of pemphigus than anything else. Dr. Bowen

had seen a case of Neumann's in Vienna, and this one brought that one back very vividly to his mind. He regarded the term "pemphigus" as a most indefinite one, and thought that it gave very little idea of the pathology of the case under discussion. Dr. S. Sherwell had seen a case with analogous symptoms in a woman, which was cured by ovariectomy. Dr. J. E. Graham related the history of a similar case of his own. It became much better under arsenic, but suffered a relapse.

Dr. J. N. Hyde, in closing, said that in his case there was no disease of the ovaries. He regarded the prognosis in his case as not good.

Dr. H. W. Stelwagon then read his paper on "A Study of Mycosis Fungoides." It was discussed by Drs. Hyde, White, Hartzell, Bowen, Duhring and Fox. Dr. Hartzell emphasized the infectious nature of the tumors, and thought that we must look to inoculation experiments for its proof. Dr. Bowen spoke of the disagreement among pathologists as to the exact nature of the tumors. Dr. Duhring said that the disease was a general one of the skin, and did not seem to affect other organs to any extent. He believed it to be an infectious disease. It may be regarded as on the border line between an inflammatory new growth and a tumor. Dr. Fox related a case of apparent infection of the disease in the New York Skin and Cancer Hospital. He also spoke of the early diagnosis of the disease, and reported a case that at first looked like an eczema marginatum, but afterwards developed the characteristic tumors.

Dr. Stelwagon, in closing, said that he found, in looking up the literature of the disease, some fifty or a hundred reported cases. It was exceptional for the disease to begin as tumors.

Dr. M. B. Hartzell, of Philadelphia, then read his paper on "Lymphangioma Circumscriptum, with Report of a Peculiar Case." It was discussed by Drs. Stelwagon and Bowen.

Dr. H. G. Klotz, of New York, followed with a paper: "Remarks on Carbuncle, with Report of a Peculiar Case." It was discussed by Dr. Bowen, who spoke of the remarkable paper by Dr. Warren, of Boston, describing the pathological anatomy of the disease.

Dr. C. W. Allen then made some remarks on "Erythema of Nalvus Nuchæ." Dr. Zeisler thought it probable that erythema nuchæ was often due to pressure and rubbing. Drs. Fox, Duhring, Grindon and White also took part in the discussion.

Dr. J. Grindon read a paper on "A Case of Lichen Ruber." Dr. Zeisler would be inclined to view the case as one of lichen planus. In this disease plantar and palmar thickenings are apt to form. Arsenic often cures these patients. Dr. S. Sherwell agreed with Dr. Zeisler in his diagnosis, though the case presented many exceptional features; one especially being the involve-

ment of the nails. Dr. White believed the case to be one of lichen planus, and spoke of the uncertainty surrounding the whole question of the lichen group. Dr. Hyde said that he always found the polygonal outline of the papules to be well marked, something that does not seem to be familiar to the Germans and French. Dr. Duhring agreed with the previous speakers in this diagnosis. The polygonal shape and umbilication are often wanting.

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

The health of the city continues to be in a very satisfactory condition. During the week ending September 12th 747 deaths were reported, representing an annual death rate of 23.05 per thousand inhabitants in a population of 1,690,076, against 822, the average number for the same week during the past five years, and the average rate 23.48. This is an increase of 11 on the mortality of the preceding week, and this slight increase was chiefly due to diseases of the respiratory organs. The deaths from this class of diseases were, bronchitis, 25, pneumonia, 51, and phthisis, 102. In contagious diseases there were 24 cases of measles, with one death, 80 cases of diphtheria, with 21 deaths, and 42 cases of typhoid fever, with 9 deaths. Diarrhœal diseases, one fatal in 112 cases, and there were 341 deaths among children under 5 years of age. The births reported for the week exceeded the deaths by 258; which is unusual in this city; although it must be borne in mind that while the necessity of obtaining from the Health Department a burial permit in every instance secures the report of every death occurring in the city, the registry of births is by no means so complete.

It is generally conceded that an important factor in the preservation of public health in a great city is a cleanly condition of the streets, and the mayor of New York, in consequence of the representations of the Board of Health in regard to the unsatisfactory manner in which his duties have been performed, has very properly removed the Commissioner of Street Cleaning. In a communication addressed to the mayor on September 15th, President Wilson, of the Health Department, called his attention to reports of the regular monthly inspection of the streets for August, of a special inspection made on the 14th, by sanitary officers of the Department, and of Dr. Morean Morris, Chief Inspector in charge of the Summer Corps of Physicians; after which he went on to say: "Cleanliness of the streets is regarded by this Department as most important to the public health, and it is apparent from the reports also referred to that their condition is far from satisfactory in this particular, and that this subject, for sanitary reasons, demands special attention."

It seems that some time ago the mayor asked the Board of Health to make a thorough inspection of the streets,

as regards their sanitary condition and the effect upon the public health; and it was upon the strength of the reports thus furnished him that he decided to take the step which he did. According to the city statutes now in force, the head of the Department of Street Cleaning is removable by the mayor, provided such removal meets with the approval of the Board of Health, whenever the mayor shall certify that to his judgment such removal is required in the public interest. It is needless to say that in the present instance when Mayor Grant had certified to this effect the Health Board promptly gave its approval of the removal of the Commissioner.

The new incumbent of the position, Mr. Thomas S. Brennan, who, it is believed, will conscientiously and thoroughly carry out the work he is paid to do, is a man with an exceptionally large experience in the administration of the charitable and criminal institutions of the city. Also, it may be stated, he has an exceptionally large acquaintance among the medical profession of New York, with many of the most prominent of whom he came in constant contact for a long period of years. This career in many respects is an interesting one. In 1859, at the early age of 16, he was appointed a night watchman at the Bellevue Hospital, and was soon promoted to the captain of the watch and night storekeeper. He was next transferred to Charity Hospital, on Blackwell's Island, where he became steward and deputy warden. In 1866 he was made warden of Bellevue Hospital, in which capacity he remained until 1875, when he was appointed one of the Commissioners of Charities and Correction; a position which he held continuously for fourteen years and eight months. These commissioners, it will be remembered, have charge of the affairs of all the hospitals, asylums, prisons, and other charitable and penal institutions belonging to the city.

Sanitary superintendent Wm. A. Ewing, who has just returned from abroad where he has been making a study of the sanitary methods in vogue in some of the principal cities, expresses the opinion that while the streets of New York are certainly kept as clean as those of most of the latter, so far as our sanitary regulations in general are concerned we are far in advance of any of the European cities he visited. The plumbing in the hotels and public buildings here, he says, is eminently superior to anything of the kind abroad, and our supervision and care of contagious diseases, he also states, are the very best that he has seen anywhere. While in London Dr. Ewing attended the International Congress of Hygiene and Demography, and he found that the exhibits sent by the New York Health Department were by far the largest and best there. He took with him to the Congress and placed on exhibition plans of the plumbing and drainage, and of the lighting and ventilation of some of the best tenement houses here, as well as the plans of older tenement houses which had been altered in order to improve their sanitary condition; and these plans excited so much interest among the sanitary engineers and architects present that at their request for more time to examine the exhibits he left them in London for a week after the close of the Congress.

There has lately been brought to this city a remarka-

ble case of parasitic growth, the subject of which, born in India, is known as the double bodied Hindoo boy. A number of physicians and others were invited to a private inspection of the lad at the Metropolitan Hotel, and Dr. George D. Bleything has made the following report concerning him: "I have examined the boy Laloo in the presence of Dr. W. G. Thompson, of the New York University Medical School, Dr. J. Blake White, of Charity Hospital, and a number of medical gentlemen and representatives of leading newspapers and medical periodicals, and find him to be a remarkable case of arrested development in foetal life. The boy himself is a fine, bright, well developed youth of eighteen years, and attached to the extremity of his sternum is the incomplete figure of a twin. The arms are given out, without scapulæ, from the sternum of the young man. The trunk is short and incomplete, but it terminates in a pelvis with which the legs are connected. There would seem to be no separate heart in the parasite, and the pulse, both radial and axillary, is synchronous with that of the autosite. There is ankylosis of the joints in the undeveloped child. The young man is conscious of a sensation when this second body is roughly touched." It is said to be the opinion of competent surgeons who have examined the boy, that the parasitic growth could be removed without serious injury to him; but in that case his value as a museum "freak," which is now very great, would, of course, collapse. As it is, he does not appear to suffer much inconvenience from his unsightly incumbrance, and he is very agile in his movements.

P. B. P.

Illinois Army and Navy Medical Association.

Editor Journal of Am. Med. Assoc'n.—At the meeting of the Army and Navy Medical Association, held in Chicago, October 7th and 8th, the following resolution was offered and unanimously adopted, viz.:

WHEREAS, In view of our high esteem for Dr. John H. Rauch, as a medical officer of the United States Army during the war of the Rebellion, as a gentleman of worth and culture, and for his most efficient services as a member of the Illinois State Board of Health, whereby the sanitary conditions of the State and Nation have been greatly improved, the standard of medical education elevated, and the interests of profession and people most thoroughly guarded, therefore,

Resolved, That we hereby express our regret that so efficient a member of the Board of Health of the State of Illinois, should have retired from that body. No more active, efficient, earnest worker, can be found among the medical profession, to fill that important position, and we believe that the interests of the people as well as those of the medical profession, will be advanced by his recall to duty thereon.

Very respectfully,

EDWARD P. BARTLETT, Secretary.

Springfield, Ill., October 14th, 1891.

Lost Papers.

Editor A. M. A. Journal, 68 Wabash Ave., Chicago, Ill.

Dear Sir:—On yesterday the clerk of the Maxwell House here, handed me a package of papers, which proved to be the notes and original papers read in the Section of Practice of Medicine, at the meeting of the Association held at this place in May, 1890. They evi-

dently were lost, and only now have come to light. If you desire the package, I will forward it to you, as many of the essays bear the marks of careful preparation, and no doubt the authors would be glad to either get their copy again or have it published by you. Very truly yours,

J. D. PLUNKET, M.D.

Nashville, Tenn., October 17, 1891.

The misplacement and apparent loss of the papers of the Section on Medicine last year was a source of much trouble to the Editor of THE JOURNAL, and every possible means was used for their recovery. We are glad that even at this late date they are discovered, and suggest that the authors of those papers write to Dr. J. D. Plunket, of Nashville, enclosing stamps for their return.

BOOK REVIEWS.

MASSACHUSETTS STATE BOARD OF HEALTH REPORT FOR 1890. Boston: Wright & Potter Printing Company, State Printers.

The two volumes before us surpass in several points any previous publication by this State Board. Part I, containing 850 pages, is devoted to the examinations of water supplies and inland waters, made from 1887 to 1890, by engineers, chemists, biologists and health officials, under the supervision of Mr. Hiram F. Mills, engineer member of the Board, whose elaborate classifications and tabulations form the principal part of the first volume. Suitable maps, plates, photo-micrographs and charts abound in the two volumes. Part II, comprising 900 pages, describes the experimental investigation on the purification of sewage by filtration and by chemical precipitation, also on intermittent water filtration, and on the beginnings of bacteriological research, both as to water and sewage. This latter research is under the direction of Professor W. T. Sedgwick, State Biologist, and is the means of bringing to the front some original discoveries by Mr. E. O. Jordan, "in this new branch of sanitary science." The bacterial flora of the sewage examined at the Lawrence station was found to be large and various, some of which have not been hitherto described. The two species most frequently observed in the sewage of Lawrence were the *bacillus coli commune*, and a species isolated and named, for the first time, by Mr. Jordan, as the *bacillus cloacæ*. This report is ultra-technical in scope, it scarcely contains an allusion to typhoid fever, whereas in point of fact it is little else than an earnest and most laborious attempt to defend the State against the constantly advancing fever-foe.

ESSENTIALS OF ANATOMY AND MANUAL OF PRACTICAL DISSECTION, together with the Anatomy of the Viscera. Prepared especially for Students of Medicine, by CHARLES B. NANCREDÉ, M.D., Professor of Surgery and of Clinical Surgery in the University of Michigan. Fourth Edition, revised and enlarged by an appendix containing Hints on Dissection, by J. C. DA COSTA, M.D., based on the last edition of Gray's Anatomy. Thirty handsome full-page Lithographic Plates, in Colors, and 188 fine Wood-cuts. Philadelphia: W. B. Saunders. 1891.

The first edition of this work on the "Essentials of Anatomy" was issued in 1888, and it has proven to be

one of the most popular of "Saunders' Question Compend." That students of medicine, for whom it was especially prepared, have made a demand for it, is fairly indicated by the fact that this edition begins the fourteenth thousand placed on sale. It may, in many respects, be considered an epitome of Gray's popular work on general anatomy, at the same time having some distinguishing characteristics of its own to commend it. The plates are of more than ordinary excellence, and are of especial value to students in their work in the dissecting room. It can be recommended to them.

APPLETON'S SCHOOL PHYSICS embracing the results of the most recent researches in the several departments of Natural Philosophy. American Book Company, from the press of D. Appleton, & Co. 1891.

This first edition, prepared by J. D. Quackenbos of Columbia College, Alfred M. Mayer of Stephens Institute of Technology, Francis E. Nipher of Washington University, Silas W. Holman of Massachusetts Institute of Technology, and Francis B. Crocker of Columbia College, needs no further assurances than is given by their names and their official positions that the work is authoritative, and that it will be found to be useful.

Presenting, as it does, a view of Natural Philosophy, as interpreted and accepted with the light of modern science and investigation and thus brought fully abreast of the present day, it will be of especial service to students of medicine who have been denied the advantages of a collegiate training.

ATLAS OF CLINICAL MEDICINE, by BYROM BRAMWELL, M.D., etc. Assistant Physician to the Edinburgh Royal Infirmary, etc. Volume i, Part ii. Edinburgh: T. and A. Constable. The University Press. 1891.

Part second of this excellent work has just been issued and it is fully equal to the first part, recently issued.

This number treats of

First: Addison's Disease, clinical investigation of Addison's Disease. Two cases simulating Addison's Disease.

Second: Melanotic Sarcoma with Pigmentation of the Skin. Clinical investigation of cases of Melanotic Sarcoma.

Third: Hodgkin's Disease. Clinical investigation of cases of Hodgkin's Disease.

With it are superior illustrations of the text, and with additional plates showing Molluscum Fibrosum. Xeroderma. Pigmentosum. Mania.

Should the high standard which characterizes the two numbers of the work already issued, be maintained it will prove a valuable addition to clinical medicine that will be welcome and that should be so well supported by the profession as to encourage authors and publishers to issue more works of the kind.

ESSENTIALS OF PHYSIOLOGY. By HOBART A. HARE, M.D.

This is one of Saunder's exceedingly useful little compends, and is one of the best of question compends. The author has done his work thoroughly and well, and no one knows better how to present those points useful to the student than Dr. Hare. The plates of the cranial nerves from Arnold are superb.

MISCELLANY.

DR. THOS. F. RUMBOLD, of St. Louis, is now sojourning in California. Twenty-five years' exclusive office practice has undermined his health. He will remain there a year longer. His address is San Francisco, Hotel Pleasanton.

THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.—Preliminary programme of the session of the Southern Surgical and Gynecological Association to be held in Richmond, Va., November 10th, 11th, and 12th, 1891.

PAPERS TO BE READ.

The President's Annual Address, Louis S. McMurtry, M.D., St. Louis, Mo.

Remarks on Systemic Infection from Gonorrhœa, Illustrated by Cases, Bedford Brown, M.D., Alexandria, Va.

The Rational Treatment of Peritonitis Based upon the Consideration of the Pathological Conditions Present, W. D. Haggard, M.D., Nashville, Tenn.

A Medico-Legal Aspect to Pelvic Inflammation, W. W. Potter, M.D., Buffalo, N. Y.

Complications in Pelvic Surgery, and How to Deal with Them, Joseph Price, M.D., Philadelphia, Pa.

Cholecystotomy—Report of Case—52 Gallstones and 10 Ounces of Pus Removed—Success, W. B. Rodgers, M.D., Memphis, Tenn.

Some of the Complications of Psoas Abscess, J. McFaddin Gaston, M.D., Atlanta, Ga.

Laparotomies Performed in the Past Year, Thomas Opie, M.D., Baltimore, Md.

Imperforation of the Rectum, Geo. Ben. Johnston, M.D., Richmond, Va.

A Case of Induced Abortion for the Relief of the Nausea and Vomiting of Pregnancy, with Remarks, Christopher Tompkins, M.D., Richmond, Va.

The Principle of Drainage as Applied to Surgery of the Deep Urethra, F. W. McRae, M.D., Atlanta, Ga.

The Neuroses of the Genito-Urinary System in the Male, Frank Lydston, M.D., Chicago, Ill.

Nephrectomy, with Report of Cases, Edwin Ricketts, M.D., Cincinnati, O.

Venomous Serpents of the United States, and the Treatment of Wounds Inflicted by Them, Paul B. Barringer, M.D., University of Virginia.

A Report of Some Additional Cases of External Perineal Urethrotomy Without a Guide, J. Edwin Michael, M.D., Baltimore, Md.

Growth of Fibroid Tumors of the Uterus after the Menopause, Jos. Taber Johnson, M.D., Washington, D. C.

The Part the Shoulders Play in the Production of Laceration of the Perineum, with Suggestions for its Prevention, W. D. Haggard, M.D., Nashville, Tenn.

The Pedicle in Hysterectomy. How Formed; Its Subsequent Behavior; Its Final Condition, I. S. Stone, M.D., Washington, D. C.

A Case of Pelvic Abscess, John Brownrigg, M.D., Columbus, Miss.

A Case of Cyst of the Mesentery, with Remarks, J. A. Goggans, M.D., Alexander City, Ala.

The Female Urethra, K. P. Moore, M.D., Macon, Ga.

Medico-Legal Aspect of Intestinal Surgery, J. D. S. Davis, M.D., Birmingham, Ala.

Albuminuria; Its Relation to Surgical Operations, J. W. Long, M.D., Randleman, N. C.

Senile Gangrene, Frank Prince, M.D., Bessemer, Ala.

Hæmorrhage versus Shock, W. L. Robinson, M.D., Danville, Va.

Treatment of Gallstones, with Report of Cases, W. E. B. Davis, M.D., Birmingham, Ala.

(Title of paper not determined), Hunter McGuire, M.D., Richmond, Va.

(Title of paper not determined), Duncan Eve, M.D., Nashville, Tenn.

(Title of paper not determined), A. V. L. Brokaw, M.D., St. Louis, Mo.

(Title of paper not determined), Chas. A. L. Reed, M.D., Cincinnati, O.

(Title of paper not determined), W. F. Westmoreland, M.D., Atlanta, Ga.

LOUIS S. MCMURTRY, President.

W. E. B. DAVIS, M.D., Secretary.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from October 10, 1891, to October 17, 1891.

Capt. George T. Beall, Medical Storekeeper U. S. A., granted leave of absence for one month. During absence of Capt. Beall, Asst. Surgeon Chas. B. Ewing, U. S. A., attending surgeon, St. Louis, will take charge of the medical purveying depot in that city.

Captain Charles M. Gandy, Asst. Surgeon U. S. A., is relieved from duty with Army Medical Board, to take effect on its final adjournment, and ordered to Ft. Yellowstone, Wyo.

Capt. Robert B. Benham, Asst. Surgeon U. S. A., is relieved from duty at Ft. Hamilton, N. Y., and ordered to Mount Vernon Bks., Ala., for duty.

First Lieut. William N. Suter, Asst. Surgeon U. S. A., is relieved from duty at Ft. McKinney, Wyo., and ordered to Ft. Grant, Ariz., for duty.

First Lieut. Harlan E. McVay, Asst. Surgeon U. S. A., is relieved from duty at Ft. Mackinac, Mich., and ordered to Ft. Wingate, N. M.

First Lieut. James D. Glennan, Asst. Surgeon U. S. A., is relieved from duty at Ft. Riley, Kan., and ordered to Camp Oklahoma, Oklahoma Ter.

First Lieut. Merritte W. Ireland, Asst. Surgeon U. S. A., is relieved from duty at Jefferson Bks., and ordered to Ft. Riley, Kan.

Capt. John M. Banister, Asst. Surgeon U. S. A., granted leave of absence for four months.

First Lieut. William N. Suter, Asst. Surgeon U. S. A., granted leave of absence for one month, to take effect on or about October 15, 1891.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending October 17, 1891.

Surgeon A. F. Magruder, ordered to the "Boston."

Surgeon W. S. Dixon, detached from the "Boston," and granted leave for two months.

P. A. Surgeon E. H. Marsteller, ordered to special duty at Baltimore, Md.

P. A. Surgeon N. H. Drake, detached from the "Albatross," and granted leave for two months.

P. A. Surgeon F. W. F. Wieber, detached from the "Pensacola," and ordered to the "Albatross."

Surgeon George P. Bradley, detached from Naval Hospital, Chelsea, Mass., and ordered to the receiving ship "Wabash."

Asst. Surgeon F. G. Braithwait, detached from the "Wabash," and ordered to Naval Hospital, Chelsea, Mass.

P. A. Surgeon H. G. Beyer, ordered to Naval Academy, Annapolis, Md.

Official List of Changes of Stations and Duties of Medical Officers of the U. S. Marine-Hospital Service, for the Three Weeks Ending October 10, 1891.

Surgeon John Vansant, granted leave of absence for twenty-three days. October 8, 1891.

Surgeon W. H. Long, granted leave of absence for thirty days. October 1, 1891.

Surgeon J. B. Hamilton, to represent the Service at the meeting of the Mississippi Valley Medical Association. October 2, 1891.

Surgeon J. H. Gassaway, leave of absence extended five days. September 28, 1891.

P. A. Surgeon W. A. Wheeler, granted leave of absence for thirty days. October 7, 1891.

P. A. Surgeon C. T. Peckham, to represent the Service at the meeting of the Mississippi Valley Medical Association. October 2, 1891.

P. A. Surgeon W. D. Bratton, granted leave of absence for thirty days. October 7, 1891.

P. A. Surgeon W. J. Pettus, to proceed to Norfolk, Va., for temporary duty. October 2, 1891.

P. A. Surgeon G. M. Magruder, granted leave of absence for twenty days. October 7, 1891.

P. A. Surgeon R. M. Woodward, granted leave of absence for thirty days. October 6, 1891.

Asst. Surgeon G. T. Vaughan, granted leave of absence for thirty days. October 6, 1891.

Asst. Surgeon J. O. Cobb, to proceed to Buffalo, N. Y., for temporary duty. October 7, 1891.

Asst. Surgeon G. M. Guiteras, to proceed to Mobile, Ala., Pensacola and Mullet Key, Fla., on special duty. October 10, 1891.

Asst. Surgeon B. W. Brown, to report to the medical officer in command, San Francisco, Cal., for duty. October 3, 1891.

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VOL. XVII.

CHICAGO, OCTOBER 31, 1891.

No. 18.

ADDRESSES.

THE WORK OF MEDICINE FOR THE WEAL OF THE WORLD.

BY H. C. HUGHES, M.D.,
OF ST. LOUIS, MO.

*President's Address before the Seventeenth Annual Session of the
Mississippi Valley Medical Association.*

MEDICAL PROGRESS.

It is gratifying to the humanitarian student of scientific medicine to note the amazing progress made in knowledge of the human organism and in resources for its regulated control in health and disease.

Since Democritus, in that classical garden at Hera, made one of the earliest dissections, to win thereby, if possible, the morbid nature of melancholia, such strides toward a knowledge of the nervous system and its diseases and their treatment have been made as would have impressed the physicians of antiquity with the belief that their modern brethren were sorcerers and armed men bearing charmed lives. Much of this has taken place within the past three decades, when I entered the profession but little connected to now was known of the wonderful mechanism and normal function of the nervous system and its not less astonishing morbid manifestations, as we study and treat them today. The astonishing anatomical discoveries of Charles Bell and of Claude Bernard into the intricate function of the nervous system, which with the amplifications of Solly, Abercrombie and other anatomists of the brain and spinal cord, and the contributions of our own Brown-Séquard, an American and the pioneer neurologist of our country and foremost in the world, had already attracted the attention of neurological students; but not an American or European school then a chair of Neurology or Psychiatry, though Rush had, nearly half a century before, medically described some mental diseases in the Pennsylvania hospital in advance of all the world across the sea; and his descriptions have lately been verified, approved and re-affirmed at home and abroad as evidence of our present advance in Neurology.

Notwithstanding the great discovery of Sir Charles Bell respecting the spinal nerves had long before been announced to the world, the diseases of the sympathetic nervous system were then scarcely known, and are only now beginning to be generally recognized and studied. True, the great works of Rokitanski, and Kolliker, and Trousseau, were before the world, the great, the venerable Virchow was fast winning converts to his cellular pathology, the fame of Charcot as a great clinician was rapidly spreading, and Romberg had written a work on nervous diseases destined to endure; but neurology, as a special department of medical study, was not then much considered by the profession at large, though Charcot and his European *confrères* had begun to bring it into the special prominence it has since acquired. Graves and Marshall Hall, Solly and Abercrombie, Stokes and Skoda, had made their everlasting impress on the profession. The treatment of fevers had been placed on a rational basis, and the science of physical thoracic exploration and descriptive anatomy were almost as perfect then as they are now.

Velpeau, Civiale, La Rue and Nélaton, Mott, Mussey, Mütter, Stone, McDowell and Pope, with the rising Brainard of Chicago, and the surgeons of Great Britain and Germany, had made, or were making, the surgery of the middle third of the nineteenth century lustrous and renowned. The work of Corvisart had become common property; the cell doctrine was being taught; ether and chloroform were in use; and Bastian and his colleagues were vigorously and with plausibility contending for spontaneous generation against the old, but now re-affirmed and firmly established maxim: "*Omni vivum ex ovo.*"

The classical and revolutionary psychiatry and psycho physiology of Maudsly, the psychology of Herbert Spencer, and the discoveries of Ferrier, had been only dimly foreshadowed in the theoretical misconceptions of Gall and Spurzheim, and in the discovery of Broca's speech center in the third left frontal convolution of the cerebrum. Aphasia was then only known as the alalia of Lordat—an indifferent condition of the brain affecting speech without involving the intellect, and the great contest between Broca and Aubertin

before the Anthropological Society of Paris, that determined the beginning of cerebral localization as a fact of physiological science, had ended in Broca's surrender and later triumph. It is true that Pinel had already broken the shackles of the fettered lunatics of Bicetre, while Chiarugi had done the same for the chain-bound and imprisoned insane of Italy. The elder and younger Tuke, of England, were practicing and proclaiming humanity to these unfortunates in the pioneer land of the Magna Charta and habeas corpus; and Combe had said and proved that insanity was a disease and not a satanic possession, nor a proof of the anger of the gods; yet, in the profession at large, comparatively little was understood of insanity, or nervous diseases in particular. At that time, to be afflicted with many now well-known diseases of the nervous system, was to be dismissed by the physician, without attempt at treatment, as only nervous; and the unfortunate subject of hysteria, often regarded as a she-devil, who might do better if she would, because a dash of cold water in the face or down the spine brought back to its unfortunate victim the latent, abdicated, or dormant, volitional control of the higher over the lower rebellious and riotous nerve centers, got but little sympathy. Epilepsia, too, was still in the minds of some physicians, and more laymen, the Morbus Sacer which no mortal could control; while chorea still retained the name of the patron Saint Vitus, who was supposed to have had the power to stop the grimaces and jerky movements and sometimes diabolical dance, of this psycho-motor and motor center disturbance.

Brown-Séquard, and that Manchester physician, whose name I cannot now recall, who preceded him in the use of the bromides, have helped us to dispel many a theological delusion through therapeutic resources.

How unfortunate that the profession had not possessed them and the knowledge we have of their therapeutic power in the time of Cotton Mather, and of the convulsionaries of the middle ages.

It was before our day that Bayle and Calmiel described the general paralysis of the insane, and Prichard that of moral insanity; but only in your day and mine that they have come to be recognized as distinct morbid conditions of mind, though now often differently designated as paresis, parietic dementia, dementia paralytica, affective insanity, paranoia, etc.

In our day, imperative conception, morbid impulses, the *folie de toucher*, and the *folie du doute*, of the French, or the mysophobia of Hammond, and the numerous pathophobias of Beard, are studied as conditions requiring medical aid; and insomnia, as the symptomatic portentous expression of a functional or grave cerebral disease, and constipation in certain persistent forms, as a

nervous disease, are just now being studied and treated in a more judicious manner than even ten years ago. The judicious physician no longer contents himself, or satisfies his patient, with only a hypnotic in the one instant, or a cathartic to empty the sewer which soon fills again, in the other. These are but temporary expedients. Any druggist, especially if he be rash enough (and many of them have no lack of that therapeutic confidence which is always present where knowledge is least) can do this.

These patients require, in addition to temporary relief, rested and restored brains, and a re-invigorated sympathetic nervous system, especially in that of one or other of their great splanchnic cavities.

Neurasthenia, or, as I have called it, general functional neurasthenia, has come to light in my time. Doctor Van Deusen, of Kalamazoo, Michigan, and Beard, of New York, who were the first of all modern observers to describe it, were personally known to me, the latter at the time his first paper was published on the subject, and oh! what a world of woe has been saved to man and woman by the discovery—especially to woman! To be weak, exhausted, and unstable in one's nervous system is to be miserable; but to be thus miserable and unappreciated by both layman and physician, as these persons were before it was known that people might be exhausted in their nervous systems without an appreciable local disease, was pitiable in the extreme.

The doctor, searching for a *locus morbi*, and finding none in the heart or lungs, liver or other of the viscera, and none in the brain or cord, or at least nothing deemed adequate to the general nervous weakness, and, perchance, finding in poor woman some slight local displacement or catarrh, or, perhaps, even an ulceration, or some ovarian tenderness, a part of the general hyperæsthesia or an ovarian congestion that was but part of the lowered vasomotor tone which allowed of arterial failure of control and vascular fullness there, as elsewhere, in the organism, too often too hastily saddled all the blame on the disordered but unoffending organ, "more sinned against than sinning;" and attacked with knife, cautery, or mechanical scaffoldings, the local part for the physiological fault of the whole. The violence done to confiding woman in the name of surgical therapy, the needless mutilation of her special anatomy in the name of surgical gynecology are not yet fully appreciated; but, thanks to the spreading light of neurological truth, the clitoridectomies of the past, the oöphorectomies and hysterectomies of the present, except chiefly for real local surgical cause, are likely soon to be relegated to the surgery of the more barbaric past and normal ovariectomy for distant neuropathic perversion will no longer be a recognized surgical procedure. Enlightened gynecology, en-

lightened surgery and neurology are now agreed to this.

Knowledge broadens with enlarging surgical skill. To be only a good cutter is not now regarded as necessarily the best of surgical counsellors, and in the practice of surgery caution and conservatism have come to be regarded in the profession as the proper accompaniments of boldness and skill with the knife. Surgery learns caution and conservatism from widened experience, just as therapeutics has learned that the hypodermic syringe is a dangerous implement when unwisely handled, or just as obstetrics has learned that the forceps may be too handy and applied too often. On the latter subject the *Centralblatt für Nervenheilk* reports the investigations of Winkler and Wallen to the end that the forceps in delivery was a more frequent cause of diocyt than was commonly supposed. In a *post mortem* examination of an idiot sixty years of age, who had been delivered with forceps, a depression of both parietal bones, corresponding to cerebral lesions, was found. Out of ten subsequent autopsies of idiots one similar condition was found to exist, and out of twenty-five living idiots six were found to have depression of the skull.

Medical progress within the last few years has been especially gratifying, aside from having exceeded that of many years before in the many therapeutic discoveries already mentioned, most of which have been made within the past five or six years, such as the coal tar analgesias, hypnotics and Liebreich's cantharadinate of potash. We have the discovery of Morvan's disease within the past eight years, the elucidation of syringomyelia and recently the approximative identification of the two as probably Morvan's and Maries' varieties of the same disease, the discovery and differentiation of neuritides from the taxias and clearer descriptions of paranoia. The first account of that singular trophoneurosis of the bony system, acromegalia, discovered by Marie, was made in 1866, and Salemi Pace has cleared up the subject of astasia and abasia, under the title of "Partial Spinal Amnesia," so late as 1888.

But it would weary you to give a full detail of progress, even in the department of neurological medicine, made within the past year.

Let me just epitomize a little further some of the remaining most important advances, only to index them in your minds. To the reflexes have been added the virile, or bulbo-cavernous, the anal and oral, for diagnostic purposes.

To Bright's disease insanity has been added as a symptom, though this was known before. The psychopathology of the genic sense, and its aberrations, has been especially elucidated since the name of "Jack the Ripper," of Whitechapel notoriety, came before the public. The opium

psychosis, likewise alcoholism and dipsomania, have been much elucidated the past year. Additional cases of that curious phenomenon, *See-linolintheit*, or soul blindness, have been recorded, and Monk has extended the visual area of the cerebral cortex. The relation of the blood to insanity has been more satisfactorily studied, and a marked deficiency in hæmoglobin has been found among the insane. This recalls the once despised assertion of Rush, that insanity is a disease of the blood-vessels.

Buckhard has attempted the treatment of hallucinations by cutting into the ideogenic area of the brain, and in one case claims to have actually succeeded, but he will probably find few followers. Luys has elucidated the subject of chronic hallucinations, finding coarse morphological change in the paracentral lobule perceptible to the naked eye. Alcoholic neuritis, as well as other forms of polyneuritis already alluded to, has been markedly cleared up during the past year. The microbe of tetanus has been confirmed, and Ferrier's cerebral localization, in the main, still stands the test of critical, clinical and pathological experience.

In psychotherapy, the tranquilizing power of galvanic cephalic electrization, as a promoter of sleep, has been confirmed and admitted. Codia in the opium habit, and as a substitute for opium in the management of the hyperæsthetic neuropathies, sulphonal, amyline-hydrate, chloralamide, hypnol, hyoscine, phenacetine, exalgine, antipyrin, and a long list of new hypnotics, have come into practical use, while chemical synthesis signalizes one of the greatest triumphs in its history in the production of an artificial quinine, absolutely identical with the product of the cinchona tree, from a Brazilian shrub (*remijia pedunculata*), treated with iodine and chloride of methyl (thanks to MM. Grimand and Armand), while experimental physiology has proven that tolerance of and resistance to the zymotic diseases, and marked immunity from them in many instances, may be secured by protective inoculations, out of which, also, have grown Listerism and the safe, grand and painless surgery of our day—a surgery of half a century's growth, to which all the surgery of all the past in the world's history does not compare.

Congenital myotonia, as a disease of muscle, due to a persistence of or reversion to the embryonic type of muscular tissue, has been proven this year by Deliege. The pathology of athetosis has been shown by the younger Hammond, and Hachin demonstrates anew the neurotic theory of cholera. New proofs of the influence of the nervous system upon abnormal pigmentation are being constantly brought forward, and dermatology is paying large tribute to dermo-neurology in other directions, notably the eczemas.

These notes of progress show that medicine is

not standing still, but keeping up with the procession, and what is being done in my special department, is going on all along the line. What an inspiring record of discovery have we now, and what a prophecy for the future! If it be the proudest possible boast of a man to-day to be a physician abreast of the present advance in medicine, what may it be in the generation that shall come after us? What would Hippocrates think, could he now see what great results have flown from that early and faulty dissection of his friend Democritus, to which I have alluded? and what an amazing advance has been made since Vesalius, braving the superstition of his times, and even impending death for his temerity, dared to make the first human dissection. Though the atrabilis for which Democritus sought was but a myth of the imagination, from attempts like that of Democritus, grew Galen's proof that the arteries contained blood and not air, Harvey's and Jenner's great discoveries of the circulation and vaccinia and Claude Bernard's demonstrations of vaso-motor arteriole control, and Sir Charles Bell's discoveries in connection with the great sympathetic nerve.

The age that has so perfected the implements of war as to make peace profitable to all the world, that has given us the sewing machine, the telephone, the phonograph, the graphophone, the electric car for surface and aerial travel, sending man around the world in an incredibly short space of time, and sending audible messages with lightning speed of his journeyings back to his home, has given us resources in medicine and surgery equally astounding—discoveries and resources in biology, and in physiological and chemical therapy, so surprisingly grand and useful, that skepticism is silent, and criticism has become optimistic of nearly every professed novel resource of legitimate science. The favorable reception, for example, of Koch's recent incomplete discovery, is in marked contrast with the early rejection, by the profession, of the discovery of Jenner, for on the discoverer of vaccinia was bestowed, in the earlier days, aversion and contumely almost equal to the threatened anathemas of the Church upon the devoted head of Galileo.

Science is now having its innings. The patient labor of her two or three past decades is bearing fruit in medical channels for the welfare of mankind, far beyond the fondest hopes or the most exaggerated expectations of the past. The miracles of modern medicine are simply marvelous beyond all past conception of possibility. The wondrous, but unwise and unstable and morbid results of modern hypnotism, as commonly practiced, are not at all comparable to the real and permanent and safe results of modern scientific therapy—medical and surgical, and the latter are in marked contrast with the fatal mischief

of the modern mind-cure craze. Yet, in hypnotism and the faith-cures of the day, medical science discerns the influence of the psychical over the physical, and judiciously employs it. It understands and correctly interprets, though at variance with that of the ages that are gone, the significance of the royal or sacred touch—the miraculous power of priest, potentate or healing fountain. This interpretation is found in the demonstration of Salpêtrière, La Charité, and the modern miracles of Nancy. Bernheim, Charcot, Paul Richet, Luys and Braid, who preceded them, have given the explanation.

The marvelous results of modern psychotherapy scarcely exceed the effects which follow judiciously applied electrotherapy, to say nothing of anæsthesia, and the modern resources of the later materia medica proper, in systemic and local disease. The power to control symptoms fills the mind of the modern physician with amazement and his heart with thankfulness, as he compares it with the comparatively meagre resources of the past. Pain in disease is practically under his perfect control; insomnia, no matter how grave the morbid condition with which it may be allied, is no more, while the manifestations of febrile action may, whenever desired, be entirely subdued, the problem being only when to stop it. Modern therapy is to the modern physician, in regard to aberrant function, almost what the throttle valve is to the engineer of our day. Now pain and heat, sensibility, and the heart's and the mind's morbid impulses, are controlled and regulated at the will of the physician; the cerebral, gastric, intestinal, renal and hepatic functions obey him, if he be fully as skilled as he may be, with all the resources of his art at full command—not with unerring certainty as yet, but with a degree of promptness and accuracy never before attained by our science and art. Truly, we live in an era of wondrous and most gratifying resources in medicine, and the triumphs of the present and recent past give us buoyant hope of even greater victories over disease in the near future.

If I have appeared to dwell too much upon neurological progress it is partly due to the fact that advance has been especially great in this department of medical research, partly to the fact that being the first neurologist who has ever been elected to preside over this body, it is probably expected that I should discuss medical progress from my especial stand-point, but my chief reason for so doing is the great and greatly appreciated influence of the nervous system and neurotherapeutic agents in the causation, phenomena and treatment of disease, so great that neural pathology has now a place almost paramount in medical thought, so that the clear view of Cullen that all diseased manifestation is largely nervous, is being confirmed by discov-

of our day, and the advances of the century; the great nosologist wrote, tend to confirm the now famous dictum: "*Quantem ego video morborum fere omnes motibus in systemate nervorum ita pendant ut morbi fere omnes quodammodo Nervosi dici queant*," words I love to quote, though uttered over a century ago, because every step of medical observation since they were written has proved their truth. But in every department of medical investigations we are in the midst of wondrous scientific surprises. The electric fluid of the great French physiological chemist; the remarkable inoculations of his colleague, Pasteur; the researches of the great Bacteriologist, Koch, whatever we may think of tuberculin, have only been transcended by the wondrous laparotomies of Lawson Tait, suggested by our own immortal Ephraim P.owell, the brilliant craniotomies of Victor Horsley, the abdominal sections of Nicholas P. the surgical antiseptic triumphs of Lister and his colleagues. The cranial topography mapped out by Ferrier and previously pointed to by Hitzig and Fritsch have opened up the old *incognito* of cerebral physiology and paved the way to the advance of the neurotherapeutist, the neurophysiologist, and we are infinitely advanced in the present age over our ancestors in manifold resources of insight and of relief afforded by our art in desperate extremes of suffering.

SPECIALISTS AND SPECIALISM.

The recognition of special work in the vast field of practical medical therapeutics has passed under the control of the old foggy element who were in decrying specialism, and while there is still danger of specialism becoming "priggish" and "snobbish," this danger can be averted by recognition and fraternal relation of specialism with general medicine. The true specialist should be largely a consultant to the general physician and mainly indebted to it for his prac-

Specialists need only become markedly distinct in the public eye through the profession at large failing to give timely and proper recognition and to amalgamate them with the mass in Medicine. It takes up the grand salvation army of the world, physically and mentally speaking. We are approaching a day, too, when the territory of the specialist in Medicine will become common. The early coming auspicious day should be marked by all true physicians. Specialism is the advance picket guard which explores the ground ahead and ascertains if it be proper for occupancy by the grand army of Medicine. And sooner or later, the whole will take up the march and go forward to possess it.

MORAL AND SOCIAL RELATIONS.

Physicians, as a class, are honest men. Pro-

fessional pride is founded largely in candid dealings with patients. The welfare of the patient is the first law with us, and no body of men has ever had so plain a moral plank in its platform of principles as ours. The precept of the golden rule has gleamed through the conduct of the profession in all ages. It was introduced practically in the Hippocratic oath and to-day no body of men stand before the world in a more disinterested or more honest light than does the medical profession. We hold the profoundest secrets of the family with the sanctity of the professional and few of us are ever charged with filching from our patients for considerations of benefit without reasonable hope of benefiting them.

We are often charged with incompetency, but seldom with dishonesty—never justly the latter, for medicine, whatever her faults of head, has none of heart towards mankind. She is the peer of all professions, the ministry of the Gospel of the immaculate Immanuel not excepted.

The incompetency of regular medicine is the incompetency of human imperfection only—the incompetency of the times in which we live, not the lack of endeavor. Notwithstanding we live in an age that has given us the electric light, we still see some things as through a glass darkly, but it is safe to say that our profession partakes as much of the general illumination of the present age as any other of the practical arts and sciences. We have utilized the electric light in exploring the obscurest recesses of the body and the lightning in treating its diseases. We are chasing the bacilli to their lairs and seeking to solve their pathological or physiological and hygienic significance.

HOW MEDICINE HAS HELPED MANKIND.

Medicine benefits mankind in a thousand ways not appreciated without the profession, even as "the light shineth in the darkness, though the darkness comprehendeth it not."

The pestilence that once walked in darkness and the destruction that once wasted at noonday, now destroy no more, because the hand of a Jenner, a Pasteur, or a Koch has said to destroying disease, as was said by a Mightier one of old to the engulfing sea, "thus far and no farther." The destructive force of devastating nature becomes impotent of harm, and the fears of threatened and trembling humanity are allayed. Few of the thousands of human beings rescued from former peril of small-pox ever think of the inestimable service rendered them by Jenner and vaccination, as the thousands yet to be saved from terrible death, "in consumption's ghastly form," or in cholera's fatal collapse, will in the years to come give not much thought to the mysterious salvation of Liebrecht and his cantharadizin or the inestimable researches of Koch; nor will it

think of the millions of deaths saved through other bacteriological researches and the numberless hygienic, health-saving, death-resisting discoveries freely given to the world by the medical profession of the nineteenth century. How little does the world at large think, in its wild chasing after folly as it flies, after wealth and fame, honor and glory, which so elude the pursuer and throw him into the hands of the physician, of the restless and myriad-peopled world about it, which has been conquered to health since the memorable, original bacteriological discovery of Leuenbroeck, about two centuries ago, so that man now lives where he formerly died, through applied science and the labors of the medical profession. And while the conflict goes on, the physician stands sentinel for mankind, fighting his battles for him against the destroyer of his peace and the things that threaten his health and life. Yet how little does the rescued world now think of its obligations to the medical profession for its escape from the fatal dangers of malaria, and the horrible ravages of small-pox, cholera, etc. The world has almost forgotten how deadly the Pontine marshes were in the time of the Cæsars, and how comparatively safe they are now through the advances of hygienic, prophylactic, and therapeutic science.

The medical profession is humanity's earthly human providence. It watches over man, unappreciated and unthanked, often, in his hours of wakefulness and while he sleeps, from his cradle to his grave, and wards off threatened dangers unseen by others, and as in regard to that supreme Providence who rules over all, man often gives the doctor and his vigilant work for his welfare a thought only in his last hours when he is too feeble to think of anything else and, alas, sometimes when it is too late for his physical, as it may be for his spiritual, salvation. Glorious profession! practiced in the life of Christ and His loving disciple, Luke, the good physician.

NON-POLITICAL INTERFERENCE WITH PUBLIC MEDICAL CHARITIES.

The medical profession champions the cause of the weak and the afflicted. It is fitting, therefore, that I should close this address with a word for the world's helpless wards who cannot speak for themselves.

To the victors may belong the spoils of political conflict, but where the spoils are human victims, minds dethroned and sacrificed to medical incompetency and party policy, we who are the professional descendants of those who brought these unfortunates out of the cruel bondage and neglect of a past inhumanity and superstition towards them, should secure for them the proper medical, as well as custodial care, which their disease demands in lieu of their broken chains and filthy, neglected dungeons.

Many of them, even in our almshouse and county asylums, have fallen from high mental estates, even higher places than those held by some who hold in the hollow of their hands the destinies, and their pitiable helplessness mutely pleads with our consciences to extend them sympathy and aid. We should endeavor to so influence public opinion and to so use our ballot that parties and politicians so politic and inhuman as to sacrifice the mentally and physically maimed, or ill, in public hospitals and other of our eleemosynary institutions whom it is a special duty, under Providence, to guard, should know the profession's indignation and feel its power.

The ordinary physician requires several years of training in these institutions added to his general professional knowledge and experience, to fit him for the proper understanding and care of the insane. To turn him out at this time, as is often done, and put in a novice, is not only a wrong done to him who has given up his private business, but is neglecting a permanent municipal position, but it is a crime against humanity against which science, experience and every instinct of human charity protests.

It would not damage the interests of parties to apply rules of Civil Service reform and fly a non-combatant flag over our State and city hospitals, especially for the insane, remembering that the mentally maimed who have fallen from life's conflict, are entitled to something more than to be tenderly carried from the field of battle on a stretcher to a place of shelter. They should have their wounds skillfully treated and they should be restored, if possible, again to duty. The sense of duty and every consideration of social and public policy, prompts us to so do and to so demand.

THE DOCTOR IN POLITICS.

One other subject, briefly, and I close. The doctor has too long held aloof from affairs of the State. Result—our greatest names in medical history ignored if not forgotten; our highest interests and those of the people neglected and unappreciated. Benjamin Rush, great in his day and greater now, signer of the Declaration of Independence, Surgeon-General of the American army during its struggle for the life it gave the nation, and of immortal fame in medicine and a practitioner of skill and wonderful expediency in the emergency of a British embargo which saved the Continental Volunteers much suffering, has no monument to his memory. McDowell, Sims, too, and Jackson, who if ever military or civil statesman deserved to be so remembered by a grateful people, should long since have been commemorated in bronze or marble at the nation's capitol. They would have been the best medical men, imitating the great Vi-

and others abroad, had taken part in the legislation of this country. The medical staff of the army and navy, too, would have had the higher rank which they deserve.

A PHYSICIAN IN THE CABINET.

Had we thus looked to our interests the President's Cabinet would long since have been represented by one member of the profession, as the law, agriculture, finance, etc., are. We should have had the Medical Minister of Public Health, for which the American Medical Association is just now pleading, much to the profit of the people in the saving of the public health and of innumerable lives and to the honor of the profession, which, above all other callings, has been the friend and benefactor of mankind, giving to humanity one of its greatest blessings and to the world many of its greatest and best men, whatever the world may say to the contrary—men who, like Hippocrates, destroyed the most fatal of the world's delusions and proved that law and not the caprice of the gods governed Nature's rule over the morbid processes, or like Vesalius, who dared and did for mankind more than ever warrior or valiant on the field of battle—Nature's uncrowned noblemen, who may yet live in the hearts of some unlaureled, even as the memory of Harvey and Jenner and Jackson and McDowell and hosts of others here unnamed, are not yet fully appreciated by the world at large. But their deeds will shine brighter and brighter as the world comes to know them and fully realize we do their incomparable benefactions, their unsurpassed greatness and their unequalled heroism.

ORIGINAL ARTICLES.

MEDICAMENTS.

Read in the Section of Materia Medica and Pharmacy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5-8, 1891.

BY EDGAR L. PATCH, M.D.,
OF BOSTON, MASS.

After considering many subjects fitting to be brought before this Association, we selected the above as one permitting us to group a few random thoughts, serving perhaps to provoke discussion, from which may come something of value. Comparing the complex pharmacy of to-day, with its alkaloids, glucosides, neutral principles, and synthetic compounds; its coated pills, lozenges, tablets, triturate tablets, capsules and sachets, with that of the near past, manipulating crude material into infusions, decoctions, tinctures, powders and pills, we are sometimes tempted to call a halt and ask if scientific medication is any nearer, and inquire if disease is held more

in abeyance by this great array of rare and expensive remedies.

As pharmacists we may not be able to discuss why quinine at twenty-five cents an ounce cannot do all the work it performed when two dollars an ounce, nor why it is replaced by a patented product, antipyrin, of five times the present cost of the alkaloid.

We cannot tell why antifebrin at four dollars a pound shall have a different action from the same chemical product called acetanilid, costing one dollar a pound.

We can only press forward in the rush, and secure as early as possible the new medical novelty, that the commercial enterprise of the manufacturer provides, and the bitterness of human distress, with the eagerness of the physician to employ every adjunct to power of relief, creates a demand for.

The question is often asked, "Is not the manufacturer with his pseudo proprietary or patent remedies an unmitigated evil?"

The physician, distressed by the demand upon his time for the consideration of the claims of legions of new remedies:—chagrined by learning that he has been giving chlorides and sulphates and attributing their effects to phosphates:—mortified at being misled into prescribing nostrums that in composition bear no relation to their schedule of contents, declares war.

The pharmacist, annoyed at being forced to invest his capital at a loss, purchasing an original package for a single demand, or adding to his stock the tenth novelty or synthetic of similar intention and untried value, into which enters none of his learning, originality or skill, becomes disgusted.

Both appear to be planning a "coup de main" when the actual merit of some such compound and the great and permanent good it performs opens up a new era of tolerance.

Will it ever be possible to establish a joint commission of physicians and pharmacists to examine and report upon these products?

Each remedy to be investigated, and, as far as chemistry can determine it, first be proven to be true to name and assumed composition, then to be tested for therapeutic value by those perfectly capable of giving it its right estimate.

The blame of blind medication by physicians, the needless use of improper remedies, and faulty self-treatment by an uneducated public, is chargeable to physicians and pharmacists alike.

The one profession prescribes and teaches the public to call for the remedies and the other too often recommends them. Ignoring this class of medicaments, is it possible to secure anything like uniformity in medication? Has there been a decided advance in this direction? Each new class of preparations is supposed to further progress. How far this may be true let us consider.

Formerly great divergence was caused by the lack of a national standard, but now that we have one of the best pharmacopœias extant do we have constancy in composition and activity of remedies? Unfortunately many physicians and some pharmacists ignore the pharmacopœia and govern their course by a dispensatory that may or may not antedate the standard, and is not intelligently compared with it.

Again, the great variation in crude material, and the modification by manipulation prevent uniformity.

The class of fluid extracts was supposed to supply uniform, concentrated solutions, permitting small dosage, with less alcohol interference than tinctures, and free from the ferment changes of infusions and decoctions.

Assuming that the menstruum was alike for the same drug, faulty storage in too damp or too dry a situation might alter the strength of the drug from 10 to 40 per cent. by variation in moisture alone. This moisture diluting the alcoholic solvent affects its power of solution. By variation of 20 degrees F. in temperature at time of percolation, 25 per cent. difference in strength may occur. In addition to this, note the facts that the call has been urgent to modify menstrua so that the fluid extract may be used for making tinctures and syrups, and you perceive that many of this class are not fluid extracts in any accepted sense of the term.

The use of this class for making infusions and decoctions is of course a radical departure from right practice in nearly all cases. Water dissolves gums, sugar, extractives, etc., that are largely rejected by alcoholic menstrua, while the latter dissolve volatile oil and resin combinations, tannin combinations, alkaloids, etc., that are insoluble in water, and preclude the miscibility of such fluid extracts with aqueous vehicles.

Competition and storing to complete precipitation have further modified strength in drug and menstrua, until physicians testify that they find one pharmacist's tincture as strong as another's fluid extract and that tinctures, infusions and decoctions are often nearly valueless.

To illustrate this point we present five samples of fl. ext. belladonna. The official is made from the root with alcohol of 91 per cent. weight strength as menstruum. It averages to contain 8 per cent. of extractive and 83.7 per cent. alcohol by weight. No. 1, Ext. 5.6 per cent., Alc. 87.12 per cent. No. 2, Ext. 7 per cent., Alc. 83.62 per cent. No. 3, Ext. 16 per cent., Alc. 57.12 per cent. No. 4, Ext. 16.3 per cent., Alc. 48.7 per cent. No. 5, Ext. 15 per cent., Alc. 47.8 per cent.

(Examined by E. E. Bickford, Ph. G., Mass. Col. of Pharm.)

You will observe that those containing least alcohol are densest and darkest in color. This is due to excess of water and solution of more

extractive and coloring matter. Should a prescription be written calling for this fluid extract and camphor or other volatile oil, as in the official Lin. Belladonna, these fluid extracts will not dissolve them.

We also show five samples of fl. ext. of aromatic powder. No. 1, Ext. 10 per cent., Alc. 60.6 per cent. No. 2, Repercolation, Ext. 10 per cent., Alc. 61 per cent. No. 3, Ext. 7.7 per cent., Alc. 64 per cent. No. 4, Ext. 6.1 per cent., Alc. 54 per cent. No. 5, Ext. 2.3 per cent., Alc. 45 per cent.

Physical inspection of these samples shows their great variation.

To show the character of infusions and decoctions made from standard fluid extracts, we present Inf. Buchu, Infus. Capsica, Infus. Pruni Virg., Dec. Cinchonæ Flavæ and Dec. Uvæ Ursi.

Observe their unsightly appearance and note that filtration removes much of their activity.

This line of illustrations might be extended to great length, but these presented should be sufficient.

MEDICATION BY PILLS.

A pill should be a mass of medicinal matter spherical or ovoid in form, of such consistence as to maintain its shape and yet be readily soluble or disintegrated in the fluids of the stomach.

If properly made, no doubt a fresh pill is always better than an old one. It is not in our province to tell what the physician shall order in pill form, but it is a great pity that more discrimination is not used in this direction, and it may in some cases be better for the patient that the pill is old and does not act. The superiority of finish and greater palatableness of coated pills and the delay incident to waiting for freshly made pills has opened the way to the introduction of those of manufacturers. We are not prepared to say that this is against uniformity. If you examine the thirty samples of pills put up extemporaneously, you will find a wonderful variation in the products obtained by the same prescriptions.

If you compare the thirty specimens from the manufacturers, you find a great range of style.

Note the citrate of iron and quinine pills green, red and black. The official salt is red.

Note the A. S. & B. pills. Mostly black. The mass is greenish, but the doctor says the black pill is more active, and so the patient must have a painted pill. Note the yellow quinine pills. This is simply due to age. Quinine, cinchonidine and many other masses change in this way.

Note the five kinds of Bland's pills.

The common formula calls for equal weight of ferrous sulphate and potassic carbonate. This gives a large excess of potassic carbonate and an alkaline pill. Such pills gelatine coated, the coating dulls. Note then this glossy pill with

mass nearly neutral, practically Vallet's mass with potassic sulphate added. Notice this beautiful pill, type of a line of "*gelatine-coated*" (?) goods "*without pin-hole.*" An hour of maceration in water does not expand any gelatine or act upon the pill. Cutting with a pen-knife reveals a *sugar coating*. Alcohol removes its glossy coating of *resinous matter*. Note how readily the iodide of iron pills decompose.

Yet, despite the fact that the call for style and durability has led to the introduction of wonderful "*improvements*" (?) in pill making, it is doubtless true that manufactured pills average being nearer to their assumed composition than will the same number and variety obtained at the dispensing counter.

TABLET MEDICATION.

As a supposed advance upon pills, compressed tablets were introduced. The general claims were—"made from dry powder, without excipient and much more soluble than coated or old stock pills."

These claims are in a measure fallacious.

Crystalline salts can often be compressed without the addition of foreign matter, but powdered drugs and such chemical products as sodium salicylate, reduced iron, quinine sulphate, etc., must be moistened with some excipient, granulated and dried, before compression.

To prevent the adhesion of many of these masses to the dies, some agent must be employed for lubrication and this diminishes the solubility. Brief consideration will show that a compressed tablet, offering much less surface to the action of the solvent than does the original material in powder form, will always be less soluble.

If the reverse occurs the tablet cannot be true to its label. To illustrate. We have some quinine bisulphate, some tablets of the same made by compression without any addition, and samples of commercial products.

You observe that the salt dissolves by much agitation in the quantity of water used; the commercial tablet much slower, but, presto, the commercial tablet falls apart and dissolves quicker than the original salt. The bubbles of gas evolved during this change hint at the character of this "*improvement.*"

Note how quickly this sodium salicylate dissolves. Observe the difficulty in dissolving the tablets. Press the tablets between the fingers and note the greasy feeling. Assay and find 3 of grease in each tablet. This gives them a fine finish and tends to prevent change, and the fact that thousands of pounds are prescribed may show that their slow solubility does not impair their physiological action.

The physician wants a tasteless tablet. Note how it is arrived at in the quinine and chocolate tablets before you. The sweetest, most delicious,

can be taken ad libitum. One physician personally used the greater part of an entire package without action.

Note the variation in these alkaline antiseptic tablets. All have the same formula. Note that some make a practically clear solution. Yet if the quantity of eucalyptol, thymol and menthol claimed, was in each tablet, it would be physically impossible. But the physician may reject the stronger tablet, true to its label, and give preference to the weaker, fancying the manufacturer has some sleight of hand to overcome natural law and take his rivals at disadvantage.

Yet this form of medication has presented to the physician many valuable remedies in convenient form. It is only necessary to call attention to these peculiarities of method that you may intelligently give each its due measure of merit.

TRITURATE TABLETS.

The suggestion of Dr. Fuller that active medicinal agents be thoroughly triturated with milk sugar, the mass dampened and formed into tablets by pressing in hard-rubber molds, furnishing a friable, readily soluble product of accurate dosage, has met with the approval of many physicians.

For hypodermic use and for the great majority of remedies that can be administered in small dose, this form is undoubtedly an advance over the pill or compressed tablet triturate.

If the minimum amount of moisture is used, the change incident to molding and drying is very slight. It is a misfortune, however, that many agents are ordered in this form that are not at all adapted to it; as large doses of solid extracts, and salts that suffer decomposition when mixed and moistened.

CAPSULES.

Gelatine capsules have been recommended as furnishing a means of administering nauseous remedies in condition ready for rapid assimilation.

The intention is sometimes interfered with by the druggist first forming a pill mass of the material and placing this in the capsule, instead of using the dry powder. The moisture of such a mass, if excessive, may soften the capsule, consequently a hard mass is often used.

We have found great variation in the size of capsule employed for the same prescription, and failure to instruct the patient as to the character of the container, has brought about some very amusing episodes.

WAFERS AND CACHETS.

The wafer, a disk of flour and gum, is well adapted for use in administering disagreeable powders. A common difficulty in using them consists in moistening too much before folding,

producing a soft unsightly mass. The seal or cachet, a special form of wafer, is preferable. The edges only are moistened and two sealed together with the powder between. We believe an improvement over the present hard pills would be the furnishing of these cachets in shape and size to take pill mass of rather soft consistence, but not soft enough to impair the cachet.

ELIXIRS.

This class of medicaments has come to stay. It is a radical departure from the theory of medication by small dosage, using active fluid extracts, resin, resinoids, alkaloids, etc. These pleasantly flavored, mildly alcoholic solutions, seem to be popular in proportion as they are agreeable in taste, and to meet this requirement they are sometimes divested of much medicinal activity.

One illustration, the examination of eight samples of elixir of three phosphates, will suffice.

RESULTS OF ASSAYS.

No.	1.	Quinine as Sulph.	in each fld.,	.730 gr.	Strych.	.017 gr.
"	2.	"	"	"	"	"
"	3.	"	"	"	"	"
"	4.	"	"	"	"	"
"	5.	"	"	"	"	"
"	6.	"	"	"	"	"
"	7.	"	"	"	"	"
"	8.	"	"	"	"	"

The last two contained chloride of iron instead of phosphate of pyrophosphate. This innovation was undoubtedly made to furnish a permanent elixir miscible with water. The others, made with phosphate and pyrophosphate of iron, inevitably grow dark and form a cloudy solution when mixed with water.

We present five samples of so called elixir of three phosphates, and five of elixir gentian with tincture chloride of iron.

This running fire on preparations serves to show the variation in medication arising from

manipulation alone. Add to this the variation in crude material and we see that accurate and uniform medication is far away in the future. Yet there is a cry from the Egypt of dimness for more light through the window of standardization.

Can this be practically arrived at?
We claim that no ordinary chemist, well versed in the theory and practice of analysis, is capable of obtaining reliable results with most assay processes now in use, without much previous practice with each method. Much less can the pharmacist, constantly interrupted with the other demands of his calling, perfect himself in many processes of assay. The errors arising from false standards so obtained would introduce an element of danger more serious than any yet mentioned. We take at random results obtained by different workers on the same samples of drugs each assayer having quite the average ability and better than ordinary facilities for doing the work.

We might extend this illustration through many assays, but scrutiny of this brief table will disclose the point aimed at.

Drug.		Alkaloid.	Drug.		Free	Morph.	
		Per Ct.			Per Ct.	Per Ct.	
No.	1.	Bell Leaf.	.6	Cantharides.	.630	Po. Opium	15.48
"	2.	"	.64	"	.680	"	15.42
"	3.	"	.48	"	.700	"	12.00
"	4.	"	.43	"	.430	"	11.5
"	5.	"	.04	"	.220	"	9.
"	6.	"	.064	"	.415	"	13.5
"	7.	"	.024	"	.840	"	12.5
"	8.	"	.038	"	.615	"	10.75
"	9.	"	.24	"	.328	"	11.25
"	10.	"	.58	"	.425	"	16.

All processes involved gravimetric estimations.

We also give the percentage of activity eight important drugs, as stated by five manufacturers and by five text books. Different processes are used by the different assayers.

DRUG.		MANUFACTURERS.				
		Grav. Assay.				
Nux Vomica	Strychnine.. . . .	.9 —2.5	1.5 vol.	1.5 vol.	2.1 vol.	Extractiv
	Brucine, etc. . . . .	.5 —2.2	mixed	mixed	mixed	I. ext.
Ignatia	do.	2. —2.2	. . . . .	. . . . .	1. ext.	. . . . .
	do. . . . .	.7 —1.2	. . . . .	. . . . .	. . . . .	. . . . .
Bell. Root	Atropine . . . . .	.45— .58	.5 vol.	.5 grav.	.62 vol.	.5?
	do. . . . .	.4 —.64	. . . . .	.4 grav.	.62 vol.	.4?
Bell. Leaves	Hyoscyamine, etc. . . . .	.16— .22	.18 grav.	.10 vol.	.4 vol.	.15?
	do. . . . .	.28— .36	.37 vol.	.35 grav.	.4 vol.	.3?
Hyoscyamine Leaves	Daturine, etc.	1.35	. . . . .	. . . . .	. . . . .	. . . . .
	do.	3. —4.5	. . . . .	. . . . .	. . . . .	. . . . .
Stramon. Seed	Caffeine . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
	do. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Kola Nut . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
	do. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Guarana . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
	do. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .

DRUG.		TEXT BOOKS.				
Nux Vomica	Strychnine	1.6	1.26	.25— .5	.25— .5	.4 —1.
	Brucine, etc.	3.15	1.90	.12—1.	2.5 —3.	1. —1.
Ignatia	do.	1.5	. . . . .	1.5	.5 —1.5	1.2
	do. . . . .	.5	. . . . .	.5	. . . . .	.4
Bell. Root	Atrophine . . . . .	.3 —.5	.47—1.5	.2— .5	.15—1.	.25—
	do. . . . .	.3 —.5	.4 —.7	.83	.44	.44—
Bell. Leaves	Hyoscyamine, etc. . . . .	.1 —.5	.14— .28	.05	.04— .224	. . . . .
	do. . . . .	.2 —.3	.33— .55	.1	.02	. . . . .
Hyoscyamine Leaves	Daturine, etc. . . . .	. . . . .	. . . . .	. . . . .	2.13	2.13
	do. . . . .	. . . . .	. . . . .	. . . . .	4.5	5.
Stramon. Seed	Caffeine . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
	do. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Kola Nut . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
	do. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Guarana . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
	do. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .

Will it not be dangerous to fix a standard for these potent drugs, unless with it we have a law that they shall be assayed by experienced men at State employ, at the points of distribution? Otherwise we may be left to a variation of 1,500 per cent. on account of a faulty assay!

If we have such assay and standard, the error of manipulation will be reduced to 50 per cent. a maximum.

But if we have absolutely standard remedies, do we have *uniform medication*? Shall we not continue to hear of idiosyncrasy of patient, faulty diagnosis and prognosis, causing miscarriage of intention and application of medications?

Is not a desirable line of advance that of better training of the medical student in the direction of practical materia medica and pharmacy?

Is not the course of instruction in many medical colleges deficient in this respect?

Would not pharmacists be more intelligent adjuncts of physicians if the course of instruction in pharmacy colleges included more attention to therapeutics?

THE PREVENTION OF MORPHINISM. A THERAPEUTIC REVOLUTION: CODEINE AND NARCEINE, VICE MORPHINE.

Before the Section of Materia Medica and Pharmacy, at the Forty-second Annual Meeting of the American Medical Association, Washington, D. C., May 6, 1891.

BY J. B. MATTISON, M.D.,
OF BROOKLYN, N. Y.

The prevention of disease ranks higher than cure, and he who essays the rôle of benefactor along this line, deserves well of his fellows, be it by its success or reverse. I shall presume to make an effort at filling that rôle to-day; shall I command your attention by enlisting interest in what promises to remove, very largely, the stigma that has rested long and weightily on the healing art, and by wiping out this blot on the escutcheon, secure favor by virtue of not only advance so decided as to mark a new era in therapeutics, but, above all, by lessening in large degree the main factor in a disease that spares neither sex, state nor condition, and which, sadly, claims for its victims more of our compassion than the world will ever know.

Opium and insomnia, with the use and abuse of morphia for their relief, are the leading twin evils of the morphine disease. Quite apart, however, is a peculiar power, *per se*, in this drug which makes it, so often, a bane after blessing—a powerful influence than which a stronger, save in its degradation and death. It goes then, without saying, that if one can offer that which

will bring ease, and win the "sweet restorer" *without* this harmful sequence, he will entitle himself to the plaudit of profession and public, by averting a danger that threatens the well-being of the person and society at large. Such, in much measure, I think we have in codeine and narceine. The former has long been used, to a minor extent, the latter is rare. Opinion has varied as to their value, but my experience with each, in a field special, unique, and to some extent unequaled, has brought with it a belief in their virtue along painful, insomnic lines, and a confidence so pronounced that I bespeak for them your careful, practical consideration.

I am not willing to say there can be no codeinism or narceinism, despite the statement of Fischer that "tolerance and habituation analogous to morphine, are not caused by codeine," but I do assert that the snaring, seductive power of codeine is vastly less than that of morphia and that this one negative power for harm alone should secure for it a larger share of professional confidence and field for remedial work than it has hitherto had. Nor am I ready to say that codeine has a value, aside from its anodyne, equal to morphia in inflammatory conditions, nor that it has like power as a stimulant. To neither of these does my argument apply, but solely to its use in painful, agryptic conditions, apart from temperature rise or cardiac decline.

Codeine was discovered in 1832, by Robiquet, who wrote in its favor, and two years later, Barbier and Bertha, after a series of careful experiments, claimed its special tendency towards the sympathetic system. These reports were confirmed but, like some other valuable drugs, digitalis, for instance, the merits of codeine were for many years in abeyance, and only within the last half decade has it come well to the front with a claim for doing good work too strong to be disregarded.

Foreign physicians, especially on the continent, have always led in the use of codeine, but the time is quite here for us to follow their good example, and I cannot now do better than to commend to your careful reading a valuable paper by Lauder Brunton, the *British Medical Journal*, June 9, 1888. Dr. Brunton lauds it highly, declaring he is satisfied that, to use his exact language: "it has a powerful action in allaying abdominal pain." He cites various painful conditions in which it has served him and his colleagues well, and closing his paper remarks that he "thinks it not improbable that codeine, which has almost fallen into disuse as an anodyne, will again come into vogue." I endorse every word of Dr. Brunton's, and venture the belief that we are on the eve of a larger use of codeine, in pain and insomnia, than the American profession has yet known.

I will not weary you with stating the various

morbid conditions that codeine will control. Its province is more or less relief of any and every pain, but it is especially adapted, by virtue of its non-tolerant power, to neuralgic disorders which stand so largely and so closely in genetic relation to the abuse of morphine; and, in general, to any and all long-continued pain. Even in incurably painful conditions it is often better than morphia, bringing ease without the unpleasant gastric and other sequelæ of the latter drug.

The hypnotic action of codeine is also distinct and decided, and may be quite apart from any analgesic need. It is a reliable soporific, though sometimes acting more slowly, yet, without the dulness or headache often sequeling morphine.

A great gain in using codeine vice morphine as an anodyne and hypnotic is that it lacks that inexplicable influence of the latter—before noted—in making itself felt, apart from relief of pain, and so creating a morbid condition, a so-called "craving," that will not be denied. I confess to you, gentlemen, that though I have been studying opium and opium habitués for more than twenty years, I do not fully understand it, but am more and more impressed by this peculiar power with every case that comes under my care.

Another point in favor of codeine is the non-need of increasing the dose on long usage. The reverse so often obtains with morphia that it marks one of the distressing features attending habitual use; growing by what it feeds on, it steadily adds to the hapless lot of those who from force of conditions beyond control, find themselves compelled to mind an imperious power they are helpless to resist.

To get good results from codeine it is essential to have it pure. Such is supplied by Merck, of Darmstadt and New York. The sulphate and phosphate—the first by mouth, and the other for subcutaneous use—are the most eligible. The latter is freely soluble—more so than morphia, my usual solution being six grains to the drachm. It should be freshly made; bitter almond water tends to preserve it; I have never noted local harm.

The dose required is larger than morphia. Fischer says triple; Bartholow four times. Fischer has written more largely of codeine—detailing several years experience—than any other foreign physician, and to him is mainly due my extensive use of the drug. I commend to you his papers in the German medical press of 1888. An initial dose of one-half grain by mouth, or one-quarter to one-half grain by skin is safe, and may be repeated and increased as required.

Narceine, though so little used, is a soporific of value. It is not an anodyne. Failure will result if pain be present. The dose should be double that of morphia. The hydrochlorate—Merck—admits of hypodermic use.

Gentlemen, you have my paper. It is a plea

for less morphine—more codeine. The usual accepted statement that its anodyne and hypnotic action is weak and uncertain, is wrong. It has a constant and well marked effect as an analgesic and soporific, without unpleasant secondary symptoms—nausea, headache, and general malaise so common with morphia. I urge you to use it, and especially do I commend it to the junior members of the profession, who too often are enthused with that modern mischief-making hypodermic morphia, and have not yet gained the wisdom given their fathers, whose experience has led them to discard—increasingly often, I am glad to say—a power so potent for ill. I speak feelingly on this subject, gentlemen, for my professional work for many years has brought me in daily contact with those—mostly our own guild—whose lives have been blighted by morphia.

The easing of pain ranks next to the saving of life, and when in doing such noble work, we do it without entailing a bondage binding, it may be, for life, the millenium will be nearer than now.

Brooklyn avenue, Brooklyn.

SOME NOTES AND REFLECTIONS ON OLD REMEDIES.

Read by title in the Section of Materia Medica and Pharmacy, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 6, 1891.

BY L. E. SAYRE, PH.G.,
UNIVERSITY OF KANSAS.

It is a truism to every student of medicine and pharmacy that there is little that is absolute in remedies. Specifics exist in theory rather than in fact. But we may classify and safely divide all remedies, in point of time, into three classes. First, those which have come to us from very ancient date, which have been used from time immemorial, whose introduction into the materia medica dates back to the earliest history. Second, those of more recent date, but which are properly called old, those which have stood the test of criticism from all portions of the medical world—the old and tried remedies. Third, those which we very properly call "new remedies"—the untried remedies. This classification is true, is unscientific, but is used simply to give proper perspective to my subject. It is my purpose to dwell upon the second class, the old remedies, whose efficiency has been well tried, whose value is unquestioned.

We are living in an age of new remedies. Every medical periodical contains notices of their efficiency and power, and peculiar adaptability. They are becoming so popular that one out of every five of the profession might well suppose that a new pharmacopœia was at hand, which will, if entirely obliterate the old remedies, at least

shadow them. I do not wish to be understood as speaking slightly of the new remedies, but it seems natural that I should revert to the old, having devoted so much time in their study.

One can scarcely glance over the pages of the medical literature of the past half century without becoming impressed with the significant suggestion that a vast amount of empirical knowledge constitutes a great part of medical science taken as a whole. Crude drugs have come and gone, clinical observations upon them have been scored by the hundreds, and very many of these have left their impress in black and white, to be sure, in the pamphlets and volumes in which they are printed, but at present are happily reposing in the limbo of forgetfulness. The physician of to-day is heir to all this good, bad and indifferent empirical observation and information. This may be cause for much gratitude and pride, but one cannot resist the suggestion that the present evolutionary period of medical science has been at the expense of "putting a good deal of medicine of which we know nothing into bodies of which we know little." It is related of the oculist Wenzel that he had to spoil a hatful of eyes before he learned how to operate successfully on cataract. The application is too painfully obvious to need further comment. True to evolutionary theory, let us hope that all the empiricism of the past has had the practical result of benefit to science as well as society.

If one studies the medical literature appearing to-day he can clearly see that empirical ideas and practice are gradually giving place to rational methods and treatment, and, whilst many of the old remedies are continued, they are to serve a different purpose—are to be viewed from a different standpoint than that of even the few years preceding the present. Therapeutics, chemistry and pharmacy (which is largely chemistry applied to medicine) are growing side by side and are gradually changing the aspect that these remedies once had. Their application is becoming magnified and exalted, so to speak. The therapeutic uses of these remedies are to have their origin in their physiological action. Physiological action is to be explained and even anticipated or predicted by chemistry, and this action definitely made possible by the art of pharmacy.

Interspersed among the new remedies of to day we find the familiar forms of these old ones. The process of elimination will doubtless go on in the future as it has in the past, but from the present outlook it is fair to presume that such crude drugs as ipecac, rhubarb, cinchona, nux vomica, digitalis, hyoscyamus and a host of other like vegetable drugs, will continue. The same may be said of many of the inorganic substances as found in the salts of the alkalies, alkaline earths and metallic substances, their chlorides, bromides

and iodides; their carbonates and sulphates; their citrates and acetates, etc. Despite the theories concerning disease and the development of synthetic chemistry, which would if it could combine the veritable antagonist to each particular disease within the molecular spaces of the "benzene ring" or the "carbon chain"—despite all this, it is fairly probable that the old remedies will live to do battle with the microbes (and their poisonous products) of the twentieth century.

But these old remedies are to take a higher place than heretofore. We are to know more about them than in the days of polypharmacy and polytherapy. We are more clearly to understand their intrinsic value. That the medical profession as a whole is every day gaining more sharply defined descriptions (chemical, therapeutical, etc.,) regarding them one can readily see by glancing at the current medical and pharmaceutical literature. Since the study of alkaloidal constituents and active principles in vegetable drugs a flood of light has been poured in upon the therapeutic value and action of these; the relation of chemical composition and therapeutic action has been fully established. Aconite, belladonna and ipecac are valuable in proportion to the amount of alkaloid they contain, and so we may say of a host of other drugs. Some drugs are for certain purposes best administered in the natural combination, for reasons we are to-day better able to give. Rhubarb doubtless owes its beneficial action in catarrh of the stomach, indigestion, etc., to chrysophanic acid, one of its prominent constituents, a powerful antiseptic. In such cases is rhubarb especially valuable, because, when the drug reaches the stomach, the chrysophanic acid is separated in the nascent condition and consequently in the condition in which it is the most active. This little bit of the chemistry of rhubarb emphasizes the fact that when this drug is administered internally this constituent should be present in its integrity. To the pharmacist as well as the physician this information is equally of importance, for to him it shows that in his preparations of this drug this constituent should be retained. The adoption and use as therapeutic agents of the alkaloids, glucosides, etc., (many of the so-called new remedies) is an exemplification of the principle of advancement above stated. It has been but a few years since there was a contempt for these active principles existing in the medical profession. Quoting from a little volume (a translation) written by Dr. Robley Dungleson in 1824, he says: "There exists an objection to the principle of thus isolating and concentrating the active parts of our remedies. Perhaps every practitioner feels that medical substances are more efficacious as they are presented to us combined by the hand of Nature, than when their active part is isolated and recombined by the hand of man. Thus we

are all inclined to give our remedies in substance, as it is called, rather than as prepared in a more convenient form by the chemist or druggist; and we are only deterred from using these natural products by the greater bulk, and other inconvenient properties of them, as compared with the more artificial preparations of them." . . .

"If we take these isolated and concentrated remedies as they are, we find that at least many of them are endowed with peculiar and powerful properties; and as nobody can deny that it is far more convenient to use remedies which are in small bulk, we have to take such remedies as if they were simple remedies, and investigate their properties as we would those of any natural production." He quotes the language of some of the profession of that day as regards the view taken of the isolated principles. He says: "Ay! here they come, one after another, vaunted to the skies for properties which sober investigation shows not to belong to them; we shall soon see them laid on the shelf, until they are again held up to the world as prodigies by some future enthusiastic searchers after novelty." In the day when these lines were written quinine, strychnine, emetine and brucine were considered novelties. In the same book Dr. Dungleson defends the use of such drugs as digitalis, prussic acid, colchicum, etc., against the popular current of thought. Only a little "looking backward" is necessary to prove the proposition that we are gaining more sharply defined ideas concerning the old remedies.

We are very much indebted to the labors of pharmaceutical chemistry for the recent studies into some minuter points concerning the nature of some of these old remedies. And I may say in passing it has been largely a labor of love. I have not space nor time to amplify upon this point. I will, however, to illustrate, give one example. I will refer to the study of the constituents of the narcotic leaves as represented by the solanaceous plants, belladonna, stramonium and hyoscyamus. In presenting this I will summarize what has been done in the direction of the chemistry of these drugs. This can best be done by reference to the alkaloidal constituents. Researches prove that the three mydriatic alkaloids, atropine, hyoscyamine, and hyoscine are contained as follows: Atropine in *atropa belladonna* and *datura stramonium*. Hyoscyamine in *atropa belladonna*, *datur-stramonium* and *hyoscyamus niger*. "Heavy daturine" is identical with atropine; "light daturine" and "light atropine" are identical with hyoscyamine. Duboisine is nearly pure hyoscine. Pure atropine and pure hyoscyamine as well as hyosine are isomeric alkaloid, but possess different chemical and physical properties. Therapeutically hyosine possesses about five times the calmative power of atropine or hyoscyamine. Tropine (a product

from hyoscine) and tropic acid may be recombined under certain conditions to form atropine. The union of tropine with amygdalic acid is homatropine, or oxytoluyltropine. This body will, like atropine, form salts with acids. Thus we have the valuable mydriatic hydrobromate of homatropine. This is only one of the many interesting results of chemical study bearing upon the future of the old remedies.

At the close of their term of service the committee of revision of the 1880 Pharmacopœia issued a volume of criticisms upon the old United States Pharmacopœia. It is a volume of some 350 pages, large octavo of closely printed material. The criticisms are paragraphic, brief, and concise. It is a noteworthy fact that nearly all of these criticisms are upon the old remedies. This shows us conclusively that in spite of the prominence which has been given to the new remedies, the old ones are receiving more careful attention at the hands of the pharmacists and therapists than ever before. Were these brief notes or criticisms expanded so as to include the text of the many articles and monographs referred to, at least 12 volumes of equal size would be made. A careful study of all this literature must convince and impress any one with the significant fact that in the past decade a vast amount of work (in the laboratory and in the study) has been done upon these. My attention, as one of the members of the committee of Revision, has been especially directed to the salts of lime, copper and iron. It is plainly evident to me that, in order to bring these salts up to the present demands, a vast amount of work is required. This involves the verification of the criticisms in the laboratory, the elimination of the old text improved upon, and the addition of new material. The work in one particular salt (hypophosphite of lime) requires several days of spare time. This salt in the future should be a standardized salt, so to speak. To this end Mr. Moerck of the Philadelphia College of Pharmacy, has contributed pages of chemical literature (See *Amer. Jour. Pharm.*, 1889, pp. 329 to 332; 386; 391). This is but one item among the many hundreds of inorganic salts and their preparations, thus to be treated and brought forward to date.

The hypophosphites of each of the other bases require special analytical treatment, but they are all to be made up to a certain well defined standard. In a general way it may be said that all of the inorganic salts are to be more sharply defined by chemical tests, and the quantitative tests are to be made more rigid and severe. Wherever possible, improvement and advance is to be made. For example, chlorinated lime; the best samples of this salt formerly assayed no more than 25 per cent. of chlorine, now, the quantitative test for this salt will demand at least 30 per cent. of this

ement. No quantitative test for sulphate of copper is present in the Pharmacopœia, but a demand exists for a test which will betray a trace of impurity.

At the same time more practical and easy methods for making these tests have been studied and the purpose is by these improved methods to make "testing" more popular even among those who are away from the centers of supply and chemical apparatus. Wherever possible volumetric tests are to be substituted for the more difficult gravimetric tests. The test tube is to be made to do more duty—made to accomplish more than it has in the past.

All this points to a state of progressiveness and indicates that these old remedies are, from a pharmaceutical point of view at least, to be viewed with additional interest. The spirit of precision and accuracy is in the air, as it were; this spirit doubtless has been caught from the sister science of medicine, for it is worthy of notice that therapeutics is advancing along the same lines of precision. This one science shows at least most markedly that we are advancing beyond the domain of empiricism.

Medical literature, as has been suggested, has been prolific in its contributions to the study of remedial agents; the therapeutic work is even more interesting and important than the pharmaceutical, and, I may add, a more important factor in changing the present aspect of these old remedies. Unfortunately this literature is not as accessible as it might be to those who are interested in the revision of the Pharmacopœia. Perhaps it is not necessary that it should be, but I venture the remark the pharmacopœial revision must suffer in proportion to the indifference of the therapist in this important work. A true scientific spirit should bring together the therapist and pharmacist; the bearing this would have upon medical progress cannot be estimated. The discussion of this question, bearing as it does on the subject of old remedies, can better be left to others. I will, however, in closing merely touch upon it, using the words of Dr. E. R. Squibb (*Ephemeris*, 1889, p. 1249). After expressing his regrets that the medical profession differently treats the subject of pharmacopœial revision, he says: "The pharmaceutical profession, which has a more direct pecuniary interest in the subject, has continually increased in activity, discussing the subject in its organizations, carefully selecting its very best men for its delegates to the convention." . . . This being the case he points out that these pharmacists are to "lead the convention" which considers the subject of revision and "the revision would prevail wherever there was contrariety of interests and pharmacy would prevail." Dr. Squibb also says in another article that "while pharmacists have been fully awake and recognized

their opportunity, they have not taken advantage of this unsafe and unwise drift." "The true interests of scientific medicine and pharmacy are, of course, absolutely the same, but the interest as they exist in practice, are not always the same. And, when they are not, those of medicine should always prevail, because their relation to the sick—the object of both—is nearer and more direct. Neither can do well without the other, but the one is much closer to the issues of life and death than the other, and cannot afford to trust these issues to a more distant dependence, which must always be more largely commercial or mercantile. The Pharmacopœia is equally the reliance, the guide, and the authority of both, but cannot wisely or safely be entrusted to the control of either." But the consideration of this question may be considered remote to the interests of medicine. Be this as it may, I have thought it might be suggestive and interesting, as well, to those for whom this paper is written.

SECTION XII, ON MATERIA MEDICA AND PHARMACY.

The Section on Materia Medica and Pharmacy of the American Medical Association met in Grand Army Hall on the afternoons of May 5, 6 and 7, Frank Woodbury, M.D., of Philadelphia, Pa., chairman. H. G. Ewing, M.D., of Nashville, Tenn., being absent, owing to sickness, F. E. Stewart, M.D., of Wilmington, Del., was elected secretary *pro tem*.

In addition to the members of the American Medical Association attending the Section, there was present a delegation from the American Pharmaceutical Association, including Joseph R. Remington, of the Philadelphia College of Pharmacy, chairman of the committee; Mr. Alfred Taylor, of Philadelphia, Pa., the venerable ex-president of the American Pharmaceutical Association, who had served on the committee for revising the United States Pharmacopœia since 1840; Prof. J. M. Maisch, of Philadelphia; Prof. Edgar L. Patch, of the Massachusetts College of Pharmacy, Mass.; Prof. Chas. T. P. Fennel, State chemist of Southern District, Cincinnati, Ohio; Mr. B. T. Fairchild and Prof. Bedford, of New York City. This delegation was welcomed appropriately by the chairman, and invited to take part in all the deliberations of the Section. A committee of the Section was formed to act on publication of papers and other business that might be referred to it, this committee consisting of the officers of the Section and Mr. Joseph P. Remington.

The following papers were read and discussed:
1. Pharmacopœial Nomenclature and the Latin of Prescriptions, by Prof. Joseph P. Remington,

of the Philadelphia College of Pharmacy, and member of the committee for revising the United States Pharmacopœia.

2. The Present Status of Materia Medica and Therapeutics, by J. W. C. Cuddy, M.D., of Baltimore, Md.

3. The Working Bulletin System: A Proposed Investigation of the Materia Medica of the World under the Auspices of the Government of the United States, by Frank E. Stewart, M.D., of Wilmington, Delaware, Demonstrator of Materia Medica and Pharmacy, Jefferson Medical College, Philadelphia.

4. The Future Chemist, by Prof. Chas. T. P. Fennel, of Cincinnati, State Chemist for the Southern District, Ohio.

5. Discussion on the United States Pharmacopœia, opened by Prof. Horatio C. Wood, M.D., etc., president of the Convention for the Revision of the United States Pharmacopœia. In this discussion participated Prof. Remington; Dr. Kirnan, of Chicago; Prof. Whelpley, of the St. Louis College of Pharmacy; Dr. Prentiss, of Washington; Prof. Patch, of the Massachusetts College of Pharmacy; Prof. Maisch, of the Philadelphia College of Pharmacy, member of the committee on revision, and permanent secretary of the American Pharmaceutical Association.

6. On the Relation of the Profession to Drugs Bearing a Trade Mark; with some Remarks in Regard to the Value of the Pharmacopœia to the Physician, by Hobart A. Hare, M.D., Professor of Materia Medica and Therapeutics in the Jefferson Medical College, Philadelphia.

7. Pharmacy for Medical Men, by Prof. P. W. Bedford, of New York City, member of the committee for revising the United States Pharmacopœia, etc.

8. American Pharmacy and Legislation, by H. P. Reynolds, Plainfield, N. J.

Read by title:

1. The Relations of Physicians and Pharmacists, by E. L. Boggs, M.D., Charleston, W. Va.

2. On the Official Sulphocarbolates, by Wm. F. Waugh, M.D., Philadelphia, Pa.

3. Potassium Chlorate; Its Toxic Effects, by G. A. Fackler, M.D., Cincinnati, Ohio.

4. Some Notes on Old Remedies, by Prof. L. E. Sayre, of the University of Kansas.

5. "Guests of This Hotel are Not Permitted to Use Iodoform," by I. N. Love, M.D., St. Louis, Mo.

A very important communication from Dr. Chas. Rice, of New York, chairman of the committee for revising the United States Pharmacopœia, was read, proposing a commission of physicians and pharmacists, to be appointed jointly by the American Medical Association and American Pharmaceutical Association, for the consideration of subjects, both scientific and ethical, of mutual interest to the professions of medicine

and pharmacy, and to report annually to the American Medical Association.

In the discussion upon this paper, it was generally conceded that the recommendation of Dr. Rice was timely and valuable, and that the formation of the Section on Materia Medica and Pharmacy was instigated by the same motives and opinions expressed in the communication, as by this means any subject of interest and importance to medicine and pharmacy could be reported promptly to each national association.

The papers having all been read, a business session was held.

The business committee of the Section reported:

1. That as the communication of Dr. Rice was also covered by Dr. Stewart's paper, suggesting the formation of a special society of physicians and pharmacists, and as the subject was a very important one, that the entire subject be referred back to the committee to bring before the Section again next year for further consideration.

2. It was recommended that the committee bring before the meeting next year a plan for more complete organization, with the view of facilitating business and developing the interest of members of the American Medical Association in the Section on Materia Medica and Pharmacy.

3. Resolved, that the Government of the United States be memorialized by the American Medical Association in favor of the plan proposed by Dr. F. E. Stewart, whereby the laboratories of the army, navy, marine hospital service, Smithsonian Institution, customs service, agricultural department, and other departments of the Government having charge of the analysis and identification of drugs, may be facilitated and the results of their investigations made public, and that the information thus gathered may be disseminated for the general benefit of the professions of medicine and pharmacy.

The report of the committee was accepted and adopted, and the last resolution was directed to be referred to the general session of the American Medical Association for its consideration by the chairman of the Section.

An election for officers for the ensuing year resulted in the reelection of Dr. Woodbury as chairman, and for secretary Dr. H. M. Whelpley, of St. Louis, was unanimously chosen, the secretary casting the ballot of the meeting.

The Section then adjourned.

Signed: FRANK WOODBURY, M.D.,
F. E. STEWART, M.D., Chairman.
Secretary *pro tem*.

A MEDICAL CONSUL.—Dr. Jeremiah Coughlin, of Brooklyn, has been appointed by the President to be secretary of legation and consul general of the United States at Bogotá.

THE ACTION OF THE TURKISH BATH IN DISEASE.

Read in the Section of Medicine and Physiology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY CHAS. H. SHEPARD, M.D.,
OF BROOKLYN, N. Y.

One year ago, I had the honor of presenting before this Association certain data regarding the treatment of rheumatism by the Turkish bath. Several gentlemen controverted the position taken in that paper, and now it will be my endeavor to give some facts substantiating what was then laid before you, under the title of

THE ACTION OF THE TURKISH BATH IN DISEASE.

The Turkish bath is simply a convenient manner of applying heat to the body, and is readily adapted to any diseased condition. It is not exhausting, as many suppose, nor is its salutary influence measured by its power to produce abundant sweating. One of the most remarkable properties of the bath is its ability to allay the sense of fatigue. There is an invigoration arising from the contact of the vitalized skin with the dry heat of the bath, which gives an increased power of drinking in oxygen, through channels previously closed, and withal there is little sensible loss of matter, what is parted with being only that for which the system has no further need.

One of the uses of ordinary perspiration, is to maintain the equilibrium of temperature, on which the safety of the individual depends. As the natural average temperature of the human body is 98° Fahrenheit, Nature has provided that this standard shall be maintained in every latitude, and under all atmospheric variations. When unusual heat is applied to the surface of the body, the system is called upon to protect itself by maintaining its equilibrium at 98°, and this is accomplished by throwing out water to be evaporated from the surface. As when water becomes vapor, a large amount of heat becomes latent, so the higher the temperature, the more abundant the flow of sweat, and the more rapid the evaporation, and the heat is carried off latent in the vapor. Thus man is enabled to endure habitual exposure to an artificial temperature of dry air as high as 400° Fah. Carpenter says: "Many instances are on record of heat from 250° to 280° being endured in dry air for a considerable length of time, even by persons unused to particularly high temperature; and persons whose occupations are such as to require it, can sustain a much higher degree of heat, though perhaps not for any very long periods. The workmen of the late Sir F. Chantrey have been accustomed to enter a furnace in which his molds were dried, while the floor was red-hot, and a thermometer in the air stood at 360°."

Men engaged in various branches of manufacturing industry, such as ore smelting, iron foundries, rolling mills and glass works, are habitually exposed, for lengthened periods, to heat ranging from 200° to 350°, which they are able to sustain for years without any loss of vigor, or detriment to health. And this simply on account of the seven million little glands spread over the inner surface of the skin, which, by evaporation, send off the heat that would otherwise raise the temperature of the body. We know that no amount of heat can raise the temperature of water above 212°, so long as the steam is allowed to pass off. Just so a man can endure a temperature of even 600° for a time, with impunity, provided the skin acts freely and the atmosphere about him is dry, and drinks up rapidly the moisture that exhales. So far, indeed, from high temperature proving injurious, it is the adaptability of the skin to resist high artificial heat upon which the Turkish bath relies for its marvelous sanitary and curative powers.

Thus we see that there is no foundation for the popular prejudice about the hot air bath increasing the temperature to a dangerous degree. Such a prejudice is not only condemned by physiology and experience, but it is in direct antagonism to the very laws of our being. Now how comes it that, by a slight increase of heat, there should be a sudden power given to the skin to throw out moisture? and whence comes this moisture? From the blood. And to be able to furnish moisture, the blood must be brought to the skin; and this is the grand secret of the *modus operandi* of the Turkish bath. It is by equalizing the circulation, and thus removing congestion, whether of the lungs, the liver, the brain, or any internal organ, or tissue near the surface, or the skin itself. When heat is applied to the surface of the body, the blood that is feebly circulating within the trunk is brought to the surface and the extremities, and its water, loaded with effete and waste material from the system, is given up to protect the skin. If the heat is continued, all the energies of the system are aroused to bring into circulation the blood that has been stagnant and congesting the lungs or liver, or some other organ. Then all the absorbents are set to work, to take up any dropsical effusion, whether in the cellular tissue, or in the closed cavities, as the abdomen or chest, that it may be restored to the circulation and evaporated from the surface.

Then, again, by drinking pure water, the blood is replenished with wholesome material, while perspiration eliminates the water and poisonous matter from the system. Indeed, this is the most important purpose which perspiration serves. Man perspires, because perspiration, being the watery portion of the blood, carries out with it all extraneous and poisonous matter, thus remov-

ing all constitutional taint whether of scrofula, cancer, tuberculosis, or any blood disease.

The blood has to dispose of the worn out material which results from every motion of the body, or the mind. In equalizing the circulation we provide for the nutrition of the body; and the blood, while bringing fresh fibre, has in turn to remove old poison. In fact the blood, with its watery portion, is washing the whole internal man every instant of time, otherwise he returns upon himself his own pollution.

While, then, we are constantly creating the phenomena of life, we are at the same time generating the elements of death. Your own breath will kill; all that should come from you, if pent up within you, kills; it is poison, and here the Turkish bath comes to the aid of Nature, and purifies the blood more directly and thoroughly than any other means that science or ingenuity has ever before suggested. The proselytes of Mohamet believed that by the agency of the bath, barrenness was removed. With the ancient Mexicans it was used, not only by the sick, but by persons who had been stung by some poisonous reptile.

The skin, in this climate, and with our artificial life, is so much covered as to render it in a large degree inactive, and therefore a fruitful source of disease. Frequently it is in a state of partial paralysis, as is shown when entering the hot room of the bath; the face and hands feel the impression acutely and the rest of the body comparatively little. The least sensitive part of the body is that which is covered by clothing. Exposure to the light and air gives the skin more vitality, and therefore it is more active and sensitive. It is to be noted that among the intertropical peoples, where the skin was naturally kept in an active condition, the bath was used only in case of disease.

It is well known that but a comparatively small portion of the skin can become disorganized without causing death. In fact, we live through the skin. Every portion is pierced with fountains which flow with foul water so long as there are any impurities within, and with distilled water when they are expelled. Hence, the disagreeable odors that come to us as a warning. The impurities as well as the cleansing powers of man come from within. Disease and dirt are almost synonymous terms.

Thus do we have a large control over disease by means of the skin, and we can command the skin by means of heat. The skin becomes the prophylaxis of the other organs, and if there is any vitality left in the other organs, there is hope of life. The skin literally brings us in touch with the external world, and is the means of casting out the disintegrated tissues of the body, as well as the poisons produced by the operations through which life is generated during ev-

ery second of time. Therefore this is necessarily the first thing to be attended to, for if that organ is not kept in good working order, the whole body must suffer, while with it in proper condition health reigns supreme.

The practice of the bath refines the olfactory nerves, and renders them capable of noticing smells otherwise imperceptible. The healthy body is endowed with a sweet odor, described by those whose organs are sensitive enough to detect it, as resembling fresh sawed fir boards. There are odors to certain conditions of disease that are patent even to the superficial observer. Pathology, when carried to a greater perfection will probably enable us to detect, by the nose the existence and condition of many maladies. Herein lies a comparatively uncultivated field of diagnosis.

For the many troubles incident to childhood the Turkish bath is a panacea. With me it has superseded all other treatment, and for carrying children through all eruptive fevers of that period, it has proved equal to every emergency. The bath has been administered to children from the time they were one month old, and on occasion daily for several months, and the result has been in every way satisfactory, notably in a case of croup. A small boy about $3\frac{1}{2}$ years old, was taken late at night with the harsh ringing cough of croup, and together with the labored breathing was in a very pitiable condition. He was taken to the hot room of the bath. At first the heat did not seem to give relief, on the contrary the symptoms apparently were aggravated. Rubbing of the arms and legs was then begun, and this was pleasant to the child. An expression of enjoyment, which was his first spoken word, encouraged perseverance. Very soon perspiration began, and then the unpleasant symptom gradually lessened. He was kept in the hot room about an hour, until his breathing was perfectly natural and the perspiration most abundant, when he was washed off and put back to bed. He went directly to sleep; no more coughing; nor was he heard from again till after daylight the next morning. That was the last of the croup.

In the long list of diseases none seem more susceptible of relief by the hot air treatment than gout, rheumatism, and neuralgia. Gout is perhaps the least amenable, but a temperature from 160° to 170° acts as a complete anæsthetic to the local pains of the paroxysm, and it moves also the primary cause of the gout favoring the re-absorption of deposited urates, and their combination with oxygen, by which they cease to be injurious to the frame. Oxalic acid, a prominent product of this oxygenation, has been found in the sweat of gouty persons.

The action of the Turkish bath in rheumatism has been phenomenal, and commands the respect

and admiration of all who have investigated the subject. As this disease is indicative of an inert skin, and as the bath immediately awakens all the activities of that organ, the special poison of rheumatism is quickly eliminated and inflammation is consequently allayed. A frequent and persistent use of the bath has many times relieved what were considered intractable cases, and that which was formerly a matter of endurance for months has been reduced to weeks. The immediate relief from pain while in the hot rooms renders the treatment more than agreeable, and makes the patient desirous for its repetition, and thus the sufferer is gradually restored to his normal condition, while the freedom from continual dosing or blistering is often an object of profound gratitude. There is never any unpleasant sequela attending the Turkish bath treatment, and even when there is a tendency in the system toward the development of rheumatism, the frequent use of the bath will counteract and relieve it.

The recuperating force of the Turkish bath in neuralgia is shown by the following case. "Billy Edwards," a noted light weight, was brought to the Institution by his physician in January, 1875. He had suffered the excruciating torments of facial neuralgia, or true tic, over two months, and found no relief, though he had applied to several prominent physicians in New York City. He was given two and sometimes three baths a day, remaining under treatment ten days, when he left, entirely relieved of pain, and feeling quite well.

In the treatment of tuberculosis, the Turkish bath has proved a reliable and efficient agent. It has been shown by a series of experiments that the earlier stages of the malady are susceptible of much amelioration by the use of the hot air treatment, which comes from its power of altering the chemical and electrical conditions of the organic structures of the body, and abstracting its fluids. The importance of the functions of the skin in the pathology and treatment of phthisis is conceded by all. By eliminating poisons through its pores we restore its respiratory action, and so enable it to assist the lungs in their important functions. In the latter stages of this malady profuse sweating is one of the worst symptoms which we have to combat, but the direct action of the bath has been more strongly shown in removing night sweats than in any other symptom. At such times it is important to enlist every organ that can assist in the work. Hot air promotes the chemical changes that are constantly going on in the lungs, and stimulates the skin to its respiratory functions. The more perfectly this work is performed the greater the success in the treatment. As yet no agent has been found to do this work equally well.

Dr. Leared, one of the physicians of the London Consumptive Hospital, wrote as follows.

"Three patients affected with consumption have been for some time subjected to the Turkish bath treatment. They were all in an advanced stage of the disease, as the tuberculous deposit in the lungs was not only considerable, but had become softened or ulcerated. The general symptoms of all were greatly improved, but the most remarkable circumstance is, that in one case, the signs indicating softened tubercles have disappeared, the lung becoming comparatively dry and solid."

These patients were admitted to the hot chamber for an hour every second day, the temperature not exceeding 140°.

Sir John Fife, Senior Surgeon to the Newcastle Infirmary, says: "Great must be the value of a process which in a few minutes will secure a general diaphoresis, bring the circulation to the extremities, and equalize arterial action. It may be safe to conclude that it will be of service in every case of internal congestion, and its effects are most remarkable in obviating disorders and palliating the diseases of the liver and kidneys; for it not only distributes a more equal circulation, but allays spasm in the excretory ducts, and I am unable to point out any class of cutaneous diseases in which the Turkish bath may not prove an effectual treatment or an important auxiliary. In bronchial inflammation or laryngeal, the surface affected is instantaneously reached.

Prof. H. von Ziemssen, in his new Medical Encyclopædia, in the part devoted to kidney diseases, says: "Diaphoresis constitutes the most reliable means of reducing the dangerous dropsy. It is also the only treatment from which I feel justified in expecting a curative action on the process of disease going on in the kidneys. In this sense an efficient diaphoretic treatment fulfils not only the *indicatio symptomatrica*, but actually also the *indicatio morbis*, in a better and surer manner than any other mode of treatment. In chronic parenchymatous nephritis, I have repeatedly found that as soon as I succeeded in producing a profuse sweat every day, a more abundant flow of urine set in, and the percentage of albumen became less. We must remember that in the chronic form of Bright's disease we have to deal with a much more extensive alteration, both of the vessels and tissues, and if we expect to effect a cure by diaphoresis we must set to work in a thoroughly methodical manner and carry out the treatment with obstinate pertinacity. The method most agreeable to the patient, and most effectual, is to heat the skin in dry hot air, as is done in the so-called Turkish bath."

Dr. Sheppard, in charge of Colney Hatch Insane Asylum, Eng., says, "There is an unmitigable dread of the hot air bath as regards those who suffer from heart disease or a tendency thereto, arising from a fear of undue stimulation of the circulatory system, but it is remarkable

that the very contrary effect is produced. The bath tranquilizes and subdues."

On this point Sir John Fife adds, "In cases of heart disease the patients have undergone the process with unlooked for benefit; the extreme heat exerts less influence on the heart than the ordinary bath."

Dr. Erasmus Wilson says, "Scrofula is imperfect nutrition, cancer is imperfect nutrition, indigestion, rheumatism, gout, neuralgia, are imperfect nutrition. Give a power by which nutrition can be regulated, and you immediately control these various diseases. Now there is no power by which the proper direction of nutrition can be attained, excepting through the skin, and that I believe to be the explanation of the extraordinary results which seem to flow from the bath. The bath does no more than regulate nutrition."

In our own country, such physicians as Dr. W. A. Hammond, Dr. Austin Flint, Senior, Dr. Lewis A. Sayre, Dr. John T. Metcalf, Dr. W. H. Van Buren, Dr. George T. Elliott, Jr., Dr. F. N. Otis, and many others, have borne strong testimony to the great value of the Turkish bath in disease.

In this flood of evidence, which is not a tithe of what might be adduced, it is apparent that the Turkish bath has the effect of different medicines, in that it removes the symptoms for which they are administered; thus it is a cathartic, a diuretic, a tonic, a deterrent, a narcotic, but the effect is produced only when there is cause. It will bring sleep to the patient suffering from insomnia, but will not, like opium, make the healthy man drowsy; and relieve constipation without bringing on diarrhoea to the healthy, as aloes would. It is thus a drug which administers itself according to the needs, and brings no evil consequences, working only to place the system in a natural and healthy condition.

With a full knowledge of the uses of different degrees of temperature, we have an entire command over those acute disorders which constitute nine-tenths of our maladies.

The practicing physician, with caloric as his servant, can frequently ward off and disperse an attack of disease.

To him who would be more than a mere physician, who would seek to prevent disease as well as to cure it, this subject opens a field of immense opportunity, both as regards himself, and the community in which he lives.

The signs of the times are more than ever encouraging for the future. The medical horizon is continually broadening. The constant discovery of new remedies shows dissatisfaction with the past. The more liberal of our profession are welcoming all helpers. Already preventive medicine is stepping forward in the march of progress, and among the agencies to aid in the material

welfare of our race, both in prevention and cure, the Turkish bath will take rank second to none.

We are beginning to understand the value of the sun's rays, which the Egyptians, centuries ago, symbolized by the human hand. The sun is the source of all our physical blessings, and heat its most important effect.

Certainly a beginning in the use of the Turkish bath as a remedial agent, has been made. It has passed the experimental stage, and in the not distant future, medical science will necessarily be compelled to adjust itself in harmony with the facts so readily at hand, and so easy of demonstration.

What has been uttered is prompted simply by a strong feeling that from a study of this subject mankind may derive an immense benefit, and that our profession should take the lead in the grand work.

The Turkish bath has now been before the American public for several years, and by no means has it been accepted as fully as its merits warrant, but as Lamartine said, "Time respects only that in which he has himself a part."

Dr. Thudichum, in an able monograph read before the Medical Society of London, concluded in these words, "I have now put before you what I think right, and what we should develop. A boon to mankind, your nation, and every individual in this room. Hot air, combined with cold effusions, with shampooing, with exposure of the body to light and air, await your approval as medical agents, and your application to those under your care. I hope that you will seize the opportunity, and secure for this society a share in the merit, similar to that of which Hippocrates was proud, of having introduced the bath in the treatment of disease."

NOTES ON THE TREATMENT OF SYPHILIS. ITS EVOLUTION AND PRESENT STATUS.

Read before the Ohio State Medical Society, June 17, 1891.

BY WILLIAM THOMAS CORLETT, M.D., L.R.C.P.,
LONDON.

OF CLEVELAND, O.

Professor of Dermatology in Western Reserve University, Medical Department, Consulting Physician for Diseases of the Skin, to Charity Hospital, St. Alexis Hospital, and the Hospital for Women and Children.

The treatment of syphilis has completed a cycle, and to-day we stand upon the same ground that our medical fathers occupied nearly four hundred years ago. Familiar as they were with gonorrhoea, which even in the days of Moses was known as a "running issue out of the flesh;" familiar with the local contagious ulcers of the genitals, which had been accurately described by the most ancient medical writers of Arabia, Alexandria, Greece and Rome, they were, in 1494, amazed at the advent of a disease such as they

had never seen before and whose ravages they were unable to assuage. For nearly half a century these three diseases retained their identity in medical writings, and not until the generation passed away which had observed its invasion did confusion prevail to retard the course of future progress.

Thus the first authentic observations of the treatment of syphilis were made while it enjoyed the distinction of being a disease *sue generis*.

It soon became known that mercury had the power of controlling the disease, and it was adopted as the standard treatment. But the indiscriminate use of this potent drug led to results even worse than those of the disease itself. It was only four years after its first appearance in Europe that Gaspar Torella, physician to Pope Alexander VI, directed that the ointment then in use be reduced in strength, and soon after John de Vego, a Genoese, obtained brilliant results with a plaster which was a compound of mercury with aromatics.

Finally the belief obtained that these diseases, having a common origin in sexual contact, were alike in nature, which led to the abandonment of mercury as a specific. This was in the age of depletion, and blood-letting, starving, purging and sweating followed as a natural sequence. Nor were drugs abandoned; the new world offered numerous plants that were held in high repute among the Indians of the American Continent. Foremost of these stood guaiacum, which as early as 1508 was imported into Spain, where it soon attracted attention from the wonderful cures attributed to it. Ten years later its fame extended into Italy and Germany; special treatises were devoted to it, and guaiacum remained the recognized treatment for the "venereal disease" during the sixteenth century.

Then came sarsaparilla, which in turn threatened to supersede guaiacum and which to this day holds a high position in the popular mind as a "blood purifier" *par excellence*. But many cases, those we now know to be syphilitic, did not yield to this form of treatment, and mercury was added to the "decoction of the woods." It was in this way the decoction of Zittman became famous, which even now is extolled by some who think it a useful adjuvant in the treatment of constitutional syphilis.

During the seventeenth and eighteenth centuries there was no consensus of medical thought, consequently there was no stable or definite form of treatment. Some with retrospective bent adopted the "dry treatment of the Arabians," which aside from certain annoying observances, consisted in taking a mercurial pill morning and evening.¹

In 1758 a report was made to the Royal Academy of Sciences of Stockholm entitled "The Lo-

belia, a Certain Remedy Against the Venereal Disease. Discovered by Peter Kalm."² In this quaint document the writer describes *in extenso* its employment by the Indians of North America, the facility with which the venereal disease was cured by it, how the secret was obtained from them, and finally a comparison in which is shown its advantages over the treatment by mercury.

With the beginning of the nineteenth century an important advancement had taken place. Benjamin Bell had eliminated gonorrhœa from syphilis in 1793, and as if to clear the way for a more definite system of therapeutical investigation which now became possible, a new system of treatment was adopted; and it became by far more general than any other since the distinct features of the different venereal diseases have been lost sight of. At this time, too, a reaction was beginning to show itself against the heroic measures for the relief of disease in general. The new method was called the "Simple Treatment," and corresponded to our expectant treatment. As it was not known that the diseases, which at this time included all venereal sores, tended to recovery, the new treatment was hailed with enthusiasm. Nor was the enthusiasm ill-timed, for it taught that the disease was self-limited; that relapses which were attributed to certain drugs, notably mercury, were a feature of the disease itself, and that much smaller doses of mercury were capable of controlling syphilis than had previously been given.

A second great advancement was made in 1831, when Dr. Robert Williams advocated the iodide of potassium in the treatment of syphilis. The favorable report of its use by Ricord of Paris, and the publication by Wallace, of Dublin, in 1836, directed general attention to the drug, and it soon became extensively used.

When it became known that syphilis, if left to the natural eliminative forces of the body, became extinct in time, there was an attempt to hasten the *vis medicatrix nature* by stimulating the surface with blisters and the application of tartar emetic ointment. In the same direction, but by far the most important of these procedures was that of syphilization, which was conceived by Auzias in 1846, in the following way: In endeavoring to inoculate some of the lower animals with syphilis he obtained, as he supposed, a saturation or tolerance of the poison whereby the syphilized enjoyed immunity from further inoculation as well as from the ill effects that were known to follow the first. But experiments made so extensively by Boeck, of Sweden, and others, have relegated syphilization to the long list of abandoned methods which adorn the pages of medical history.

It was not, however, until Ricord began a

¹ Bumstead, Venereal Diseases, New York, 1866.

² Dr. Heller's Medical Notes, 1758.

systematic study of venereal sores at the Hôpital du Midi, in 1850, which enabled Bassereau two years later to announce to the world the doctrine of duality, that the modern epoch in the treatment of syphilis really began. From this time it has been separated from extraneous maladies which are unlike in nature and which differ essentially as to treatment. Note the result: Uniformity of method has succeeded the indefinite age of "new systems" and "new schools;" a uniformity, too, without the loss of individual effort to attain the highest end.

Thus systematized, the primary object in the treatment of syphilis, is to prevent systemic infection. With this in view the initial lesion has been cauterized after the manner of Ricord; it has been excised as practiced by Auspitz and Kolliker, but these procedures have failed to prevent the subsequent phenomena of syphilis. More recently Otis has advised the destruction, and where practical the excision of the initial lesion, not so much to prevent systemic infection as to destroy a focus of infection and as the quickest way of healing the sore.³

In most cases the application of mercury will cause the lesion to disappear, and except when accompanied by suppuration or necrosis, is the best means at our command. With suppuration iodoform is very extensively used; aristol is a new preparation free from the disagreeable odor of iodoform, and said to be even more efficacious; while antifebrine, in the writer's experience of three months, promises to supersede all other applications in this particular condition. But it is not with the primary sore that error is most liable to occur, for it usually disappears of its own accord; it is the systemic management, the persistent warfare against the syphilitic virus and its sequelæ that appear to be insufficiently understood by many who essay to treat the disease.

First, it is well to bear in mind that the virus may in time be eliminated by the natural forces of the body.

Second, the drug, and the only one, that is positively known to possess any curative influence over syphilis, is mercury. Under various disguises it has been given for centuries, and to-day its virtues are attributed to waters, and to nostrums innumerable. But a careful analysis enables us to affirm, that under its use the various manifestations of the disease disappear, relapses are less frequent, and finally the organism becomes free from the baneful influence and may be infected again. When to begin mercurial treatment is a point on which opinions differ. Hutchinson⁴ claims for mercury the power of aborting the syphilitic processes; he therefore gives it with the first appearance of the primary

sore. Lassar, in a personal interview, advocated its early use, "because if the disease does not prove to be syphilis it does no harm; whereas if it be specific the sooner mercury is given the better for the patient." Others again withhold the drug until secondary or systemic symptoms appear.

Doubtless the best course is to begin the use of mercury as soon as the diagnosis of syphilis is made. Previous to this the time may be profitably occupied by placing the patient under proper hygienic influences, and in the use of tonics such as iron, vegetable bitters and mineral acids, which will prove useful adjuvants to the subsequent course of mercury.

The special form of mercury that is advisable to use will depend largely on the individual requirements of a given case. Generally speaking, the protosalts are to be preferred to the bisalts at the beginning, as calomel, mercury with chalk or the blue pill either alone or combined with iron, as in formula suggested by Bumstead many years ago.⁵ In infantile syphilis, mercury with chalk is largely given in England, and has given the writer the best results. It was formerly thought to obtain a therapeutic effect of mercury it was necessary to produce salivation; we now know that the best results are gained by the continued use of the drug in quantities barely sufficient to produce tenderness of the gums.

To guard against the disagreeable complications which may occur in the mouth, the following simple rules should be observed: Before beginning the mercurial treatment, the teeth must receive attention at the hands of a dentist, and all decayed teeth either filled or removed. After eating they should be brushed with a soft brush to remove all particles of food, and if tenderness supervene a saturated solution of chlorate of potassium may be used as a mouth wash.

From the most remote times various methods have been employed to introduce mercury into the organism; plasters, inunctions, baths and ingestion by the mouth, have all had their ardent advocates.

Fumigation, which was revived by Langston Parker of Birmingham, is an efficient way of giving it and free from some of the disagreeable features of other external methods. Of late, hypodermic or intermuscular injections have been extensively used, as advised by Scarenzio, of Milan, in 1864. Lewin has especially identified himself with this form of treatment, and it has been used almost exclusively in the extensive wards of the Charité Hospital at Berlin, for the last thirty years, which of itself is a sufficient guarantee of its value and the high estimate placed upon it by this most eminent syphilographer.

³ Clinical Lectures on Syphilis, by Fessenden N. Otis, N. Y., 1881.

⁴ London Lancet.

⁵ Venereal Diseases, New York, 1866.

But he is best able to treat syphilis who recognizes the special value of the several methods at his command. For reasons that are apparent to all, ingestion by the mouth is the one most in vogue, and when well borne there is none better. Frequently, however, gastric disturbances necessitate its discontinuance, when recourse must be had to one of the other ways of administration. The choice must be determined by the physical as well as the social statute of the patient.

Inunction is very largely used both in this country and in Europe, and forms the essential treatment at the numerous springs that have been vaunted for the cure of syphilis. The skin should be prepared for the absorption of mercury by taking a warm bath with soap, best at night. Then from half to a drachm of the strong ointment should be rubbed into the skin before the fire, either by the patient or an attendant with rubber gloves.

To those who can not subject themselves to this uncleanly process, fumigation may with equal efficacy be adopted. In fact the latter offers the best means of treatment when superficial lesions are present, as in the early syphilides. But many patients cannot carry out even this, and a method less liable to exposure must be used. Here is a field for hypodermic injections, which have but one objection so far as the writer's experience goes, and that is the pain, which continues three or four hours thereafter. Again when it is necessary to obtain a rapid effect of mercury, hypodermic injections afford a most efficient means. The formula that has given the writer the best results is the one used at the Poliklinik for skin and venereal diseases at Berlin:

R. Hydrarg. bichlor., gr. $\frac{1}{4}$.
Sod. chlor., gr. $\frac{3}{4}$.
Aquae dest., ʒi . ʒij .
Sig.— ʒi two or three times weekly.

I have never seen abscess or other inflammation follow this injection.

A fertile source of error lies in supplanting mercury by the iodine compounds. If one will take sufficient pains to investigate the treatment as carried on at the iodine springs at Halle, in Austria, one cannot but be impressed at the frequency with which the patients return after having been discharged free from all manifestations of the disease. This leads us to consider the rôle iodine plays in the management of syphilis.

After a certain though variable time the lesions, which have been superficial and evanescent, assume a more destructive and indolent form; new formations appear on the surface, others occur in the various structures within. This is known as the tertiary or stage of sequelæ. The tumors and destructive processes of this stage often endanger important organs or even life itself; these call for immediate relief. In iodine and its salts we have

the best known agent for causing the rapid absorption of tissue enlargements which, as is well known, constitute the essential processes in lesions of tertiary syphilis. And clinical experience has demonstrated that these collections of granular tissue, whether in the stage of formation or decay, disappear and heal under its use. Nowhere is its action more marked than in lesions of the brain, and nowhere is it followed by more satisfactory results. In destructive processes of the upper air passages, too, its effect is almost marvelous.

The dose of the iodide of potassium, the preparation generally employed, varies greatly in different persons. I recall to mind a woman treated at the Blackfriars' Hospital for Skin Diseases, in London, who obtained the full benefit of the drug with a quarter of a grain, in fact a larger quantity produced iodism. Again, fifteen, thirty, sixty and even two hundred grains per diem is required to influence the disease. When large doses are required a combination of the iodide of ammonium and sodium, as recommended by Berkley Hill, is to be preferred.

The salts of iodine are best given dissolved in milk taken immediately before meals. When taken after eating water is the best vehicle, and it should be taken an hour after the meal. Generally better results follow the so-called mixed treatment, and as iodine should only be given late in the course of the disease, the persalts of mercury are selected, as in the following:

R. Hydrarg. perchlor., gr. ijj .
Kal. iod., ʒj .
Aquam add., ʒij . ʒij .
Sig.—Ten drops in water after meals.

As soon as the special indications for iodine have disappeared it should be discontinued, and recourse had to mercury. It has been the writer's experience in difficult cases to find that the salts of potassium have almost invariably been given early in the disease. This leads to the conclusion, which is also entertained by others, that the salts of iodine not only are ineffective early in syphilis, but are positively harmful.

It is also important to know how long mercury should be continued. This will vary in different cases, for in some the disease may disappear in three months, while as many years is the allotted time, even under the most systematic treatment. As a rule, it should be continued at least six months after the last indication of systemic contamination has disappeared. After the continuous use of mercury has been withheld it is advisable to return to it at given periods for one or two years. It is my custom, when practical, to give two courses of six weeks each the first year, and one course the second year.

But there are cases of syphilis that are conspicuous exceptions so far as treatment is concerned. First, there are those associated with debilitating

conditions, such as tuberculosis, cancer and old age. Here the treatment must necessarily be varied, and oftentimes mercury plays an inconspicuous rôle. There are other cases, fortunately rare, over which mercury has no specific influence. On this account grave doubts may arise as to the correctness of the diagnosis. Three cases of this kind under observation were in young, robust subjects, which yielded finally to $\frac{1}{20}$ th grain doses of the chloride of gold and sodium, taken from four to six times a day.

As accessories to medical treatment the patient should abstain from the use of tobacco, and be advised as to a regular course of living best suited to promote his physical welfare. Special attention should be given to the organs of elimination, and to facilitate their action water should be partaken of freely. A hot bath with soap should be taken every night, or a Turkish bath once or twice a week.

In this connection, and to emphasize the foregoing, a word about the treatment as carried on at the various springs that have taken such a hold on the popular mind, and which have become so much in vogue withal. The most celebrated establishment in Europe is doubtless that at Aix-la-Chapelle. It is claimed that the sulphur water at Aix stimulates the emunctories so that a larger quantity of mercury may be given and eliminated without causing ill effects. The principal advantage that these and other springs have over the treatment at home arises not so much from the water as from the care with which every detail of treatment is carried out. First, the diet is regulated so that a sufficient amount of nourishment is taken, and articles liable to cause disturbances of digestion, such as fruits and indigestible dishes, are withheld. The patient begins the day with a light breakfast, afterwards he walks if the weather be fine, and then takes a hot bath; after which a drachm of the strong mercurial ointment is rubbed into the skin by an attendant. He remains in a warm room about two hours and drinks during this time from one to two pints of sulphur water. He then walks, dines, and walks again, partakes of a light supper and goes early to bed. After this routine has been repeated daily for about six weeks, the lesions of syphilis have usually disappeared, and he is sent home, to return at the end of two months. The patient's attention is diverted from his malady by amusements of various kinds, so the syphilitic usually finds his stay at Aix-la-Chapelle both pleasant and profitable.

In this country the Hot Springs of Arkansas are frequented by those who think to get the disease "boiled out" of them. But it is quite generally recognized by syphilographers that the water has no specific effect on syphilis.

333 Prospect street.

PRIMARY PERIOSTITIS OF THE MASTOID.

Read before the Section of Otology and Laryngology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY H. V. WÜRDEMAN, M.D.,
OF MILWAUKEE, WIS.

My object in reporting these cases, beyond the fact that primary periostitis is rare, is to show the advisability of prompt action and radical treatment in all post-aural inflammations.

Case 1.—May 30, 1890, Mrs. M., æt. 30, a seamstress. Was convalescing from an attack of facial erysipelas, the last manifestations of which had apparently left four weeks previously. I was called in consultation by Dr. U. O. B. Wingate, on account of a painful swelling behind the left ear, which had been first observed about a week before. She had had fever for several days, and upon my examination the temperature was found to be 101°. The mastoidal region was quite boggy and exquisitely tender. The hearing distance was normal; an examination by the speculum and mirror did not even reveal congestion of the membrane. Likewise the Eustachian tubes and pharynx were apparently normal. On the same day I made a Wilde's incision, without anæsthesia, through the swollen area down to the bone. Neither pus nor necrosis were found, but the periosteum was apparently thickened. The wound was antiseptically dressed and allowed to heal from the bottom, its lips being stretched apart by strips of iodoform gauze. The operation relieved all the disagreeable symptoms immediately, the wound being healed in one week.

Case 2.—August 1, 1890. Mr. W., æt. 54, manager of large corporation. Had acute sup-puration in the left ear following epidemic influenza, but no discharge had been observed for four months. Had been under the care of an aurist for a portion of that time. He consulted me about a red and tender swelling of the left mastoid, which had commenced two days before. Temperature by mouth, 100°. Examination of the left ear showed H. D. = voice 3 M. Could not hear whisper or watch. A large perforation of the membrana vibrans existed, but no pus was visible. Leeches were applied to the mastoid, and in three days the post-aural symptoms seemed to be entirely relieved. The edge of the drum head was pared with a probe-pointed knife, and touched with 10 per cent. argent nit. on several occasions, until on the 14th of the month the perforation had nearly closed. H. D. = watch at 3 cm.

On the next day he returned to me with fever, the mastoid being again red and tender. There was no discharge to be observed in the middle ear. Leeches were again applied, the mastoid painted with tinct. iod. and antiphlogistic treatment used

the ensuing five days. The patient was confined to his room, but on account of his dread of an operation none was even suggested until such became imperative. After a very painful night fluctuation was evident, and I made a Wilde's incision, without anæsthesia, liberating several drachms of pus, which spurted from the wound with considerable force. The periosteum was much thickened and detached from the bone. In the line of incision a soft spot, about the size of a dime, was seen. This was scraped out with a sharp spoon and a drainage tube inserted. The wound was packed with iodoform gauze and bandaged. The incision was made for diagnostic purposes, but I fully expected to have to trephine the mastoid.

To my surprise on again visiting the patient I found all the symptoms relieved by the operation, he having passed a comfortable night. On dressing the wound but little pus was found and the graver operation was postponed, particularly as no sinuses could be seen in the bone. On the next dressing the wound was dry, and from this time it was allowed to close. Ten days later it had healed over. By subsequent treatment the membrana tympani was restored, and on Oct. 1, H. D. by watch = 100 cm. The patient has been apparently well since that time.

The operation was made on the first case in the stage of beginning inflammation before the formation of pus, but by the local abstraction of blood a further stage was aborted. In the second instance, the local inflammation was due to an extension of the original affection from the periosteum of the middle ear to that of the mastoid bone, and was not recognized until after pus had formed. In this case it is evident that only the covering of the mastoid and not its lining was involved. The process remained quiescent at some point in the periosteum for four months, then lighting up an active inflammation, the product of which was pus. In the first case the periostitis was undoubtedly primary, as the middle ear and canal had never been involved in an inflammatory process. In the second instance, upon first sight it seemed that the periosteum of the mastoid was the only part of the membrane involved, yet on account of the preëxisting middle ear disease we must class it as a sequel of the original affection. A remarkable event in the history of the second case was the renewal of the drum head, a process which seldom occurs in a person of such age.

Most cases showing these symptoms involve deeper structures than the periosteum and necessitate the graver operation of chiseling or trephining the mastoid. When a painful swelling appears in this region I am in favor of immediate incision, not only for the purpose of relieving the inflammatory symptoms by local blood-letting, or of releasing pus, but also as a means of diag-

nosis, as the incision may easily be extended for the operation of trephining. Wilde's incision in itself is void of danger, easy of accomplishment, and may be relied upon for relieving local inflammation by a thorough depletion of the blood vessels.

805 Grand Avenue.

FRIEDRICH'S ATAXIA; ITS RELATION TO THE CONDUCTING PATHS IN THE SPINAL CORD.

BY DAVID INGLIS, M.D.,
OF DETROIT, MICH.

At the Congress of American Physicians and Surgeons, Dr. David Inglis, of Detroit, read a paper upon the above subject before the American Neurological Association.

He reports in brief, a case of Friedrich's ataxia in a boy of six years of age, in which the symptoms conformed accurately to Friedrich's own summary of the characters of the disease, viz.: "Impairment in the combination and harmony of movements developing gradually and spreading from the lower to the upper half of the body, and always involving finally the organs of speech; sensibility and the functions of the special senses and of the brain being intact; paralysis of the sphincters and trophic disturbances are absent; less common phenomena are curvature of the spine, sensations of vertigo and nystagmus. From a clinical point of view we must regard the disease as a progressive paralysis of the faculty of combination of movements."

A review of the thirteen recorded autopsies shows a practical agreement that the pathological condition underlying the disease consists in a progressive sclerosis which always affects the column of Gall, the column of Burdach also, but not so completely, the direct cerebellar tracts with Clarke's column in most cases and the crossed pyramidal tract in some cases, but the sclerosis is here not so intense. We have to deal with a disease of the tracts which degenerate upward, which are usually looked upon as centripetal and as conveying sensory impulses.

Author contends that the symptoms of Friedrich's ataxia afford a demonstration that these tracts do not convey sensory impulses upward, for sensation is not impaired, but that they are the main tracts for the conveyance of coördinated motor impulses downwards; that their anatomical relations with the medulla, cerebellum and mid-brain, as well as the facts of Friedrich's disease agree in showing them to act to coördinate motor impulses of the mid-brain, cerebellum and higher and lower levels of the cord.

The facts of Embryology strengthen this theory; at the end of the foetal life, at a time when the pyramidal tracts are undeveloped, the posterior

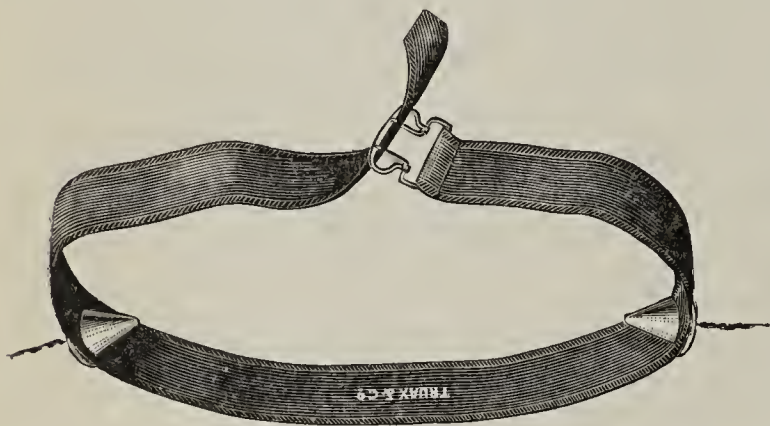
columns and direct cerebular tracts are complete. Their function evidently begins at once after birth. When we remember that the new-born infant is characterized, not by voluntary control of its muscles, not by accuracy of sense perception, but by an extensive coördination of involuntary motor functions, the conclusion is easy, that these, the only tracts fully developed at birth, subserve these purposes.

The direction of Wallerian degeneration is not necessarily the same as the direction of normal physiological impulses in any given nerve tract.

IMPROVED EAR ELECTRODES.

BY SETH S. BISHOP, M.D.,
OF CHICAGO.

These electrodes consist of two metallic cones covered with chamois, and held in position for treatment by an elastic ribbon buckled around the head.



The tips of the cones are moistened before inserting them in the external auditory canal. In order to keep them clean, it is well to place a small covering of cotton, moistened with warm water, over the tips of the cones while in use.

It is a simple matter to adjust the cones to heads of any size by having one or two extra apertures in the ribbon, through which one of the cones can be easily passed. Or a second buckle can be put between the cones, at the back of the head, in order to alter the distance.

The ribbon should never be buckled so firmly as to occasion uncomfortable pressure.

The advantages of these electrodes over the old ones commonly employed for ear treatment, are the following:

1. The electric current can be concentrated as much as is possible in the ears, instead of being diffused over the side of the head and face.
2. There is no necessity for filling the auditory canal with water, and thus macerating and relaxing the drum head.
3. The patient is relieved of the irksomeness of holding the electrodes in position, a freedom fully appreciated by those who have had experi-

ence in the old way. With the cones in position, the patient can take a comfortable treatment while looking over the morning paper or illustrated magazine. This converts a treatment that was formerly a bore into a comparative luxury.

Chas. Truax, Greene and Co., made these for me.

70 State St.

BOOK REVIEWS.

DISEASES OF THE NASAL ORGANS AND NASO-PHARYNX.
By WHITFIELD WARD, A.M. M.D.

This little work from the house of Putnam's Sons, is intended for the student and general practitioner, rather than for the specialist, and admirably fulfills its mission. A short practical treatise upon rhinology is in demand. Dr. Ward has certainly met the requirements of the general practitioners in an admirable manner.

TRANSACTIONS OF THE SOUTH CAROLINA MEDICAL ASSOCIATION. It certainly cannot be denied that there is a medical "New South." The professional ranks of the South contain many of our ablest men. In the case of those Southerners who practice in the large cities, excellent contributions to medical progress should be expected. Many of the best contributions to current medical literature are from the pens of southern doctors who do laborious country practice. The best representative society in America to-day is undoubtedly the Southern Surgical Association, members of which have contributed to the proceedings of the South Carolina Society. The present volume of transactions contains several classical and interesting articles. The papers by Dr. Kollock on abdominal section, R. A. Kinloch on drainage of wounds, and of Dr. M. P. Ravenal on general anæsthesia are especially worthy of commendation.

ESSENTIALS OF ANATOMY AND MANUAL OF PRACTICAL DISSECTION. By CHAS. B. NANCREDE, M.D. Professor of Surgery in the University of Michigan.

This is the third edition of Dr. Nancrede's work, and has been improved by the addition of osteological plates. The colored plates of anatomical studies in this book are excellent, the publisher having spared no pains or expense in their preparation.

Professor Nancrede's reputation is such that it is hardly necessary to say that the subject matter of the work is judiciously selected and arranged, and fully up to date. The book is published by W. B. Saunders.

MEMORIALS TO THE LATE DR. LEIDY.—The friends of the late Professor Joseph Leidy, of the University of Pennsylvania, are desirous of raising a memorial fund of \$100,000 to perpetuate the name of Leidy in that institution. One-half of that sum will go to the foundation of a museum, to be named after him; also an equal amount, if it can be promptly accumulated, will be devoted to the establishment of a Leidy chair of anatomy.

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SATURDAY, OCTOBER 31, 1891.

MEDICAL CRISIS IN CHINA: THE FIELD FOR
MEDICINE IN THE ORIENT.

In no half-civilized country of the Orient has medical missionary effort been expended with more liberality than in China. And yet to-day the feeling of insecurity is such that it would not be at all surprising if all that has been done should be wiped out in a day. A wave of rebellion and superstition is reported to be rolling over that vast empire, not wholly sparing the more enlightened and progressive sea-board cities. The Chinese mob, it is said, is incited against American and British missions by a belief that these foreigners use the eyes and other organs of Chinese children in the manufacture of medicines, and that these children are stolen or bought for pharmacal purposes. Denials of prejudices such as these are vain. In the mind of more than one European official resident in China, the only remedy for the present dangerous tension will be found in the throwing open to an official inspection by the Chinese government, the doors of all the hospitals, asylums and schools supported by foreign societies. This has not hitherto been the system of management, but it is recommended as an unobjectionable and feasible manner of counteracting the false reports that are spread by the leaders of the mob element.

Wherever the influence of educated medical men has been felt personally by the Chinese, the individual results—and from them spreading out in wider circles—have been markedly beneficial. Both the Chinese and the foreigners have been benefited by the good done by, and the sentiment created around the medical missions, hospitals, and schools. To quote an expression from a recent address of DR. STEPHEN SMITH of New York, "it is said that China was opened up with the point of the lancet," by the veteran DR. PETER PARKER, late of Canton. In some heathen lands the multitudes throng around the medical missions, and they have to be restrained from offering sacrifice to the missionaries, as in the days of ST. PAUL. The missionary may be respected, but the medical missionary is almost an object of worship. His cures and surgical operations are miracles to a people whose knowledge of their bodies is limited to their integument, teeth and tongue, and who believe, after centuries of opportunity to know better, that a man's brains are located in his stomach. Korea, a "hermit-nation" until a few years ago, was opened by the probe of military surgery in the hand of a missionary doctor, DR. ALLEN, who happened to be on hand shortly after a battle or *emeute*. Then too, the kindly treatment accorded to the sick in the hospitals is so diametrically opposed to the cruelties of native practice, that these hospitals become the safest spots in their cities. An English consul at Canton, during threatening times, made this memorable remark: "The hospital is safer than a gunboat." Almost without exception witchcraft, mingled with cruelty, is the medical system of barbarous peoples—and as an extreme example, and one not very well known, we may mention the treatment accorded to twin-births in Cameroons, West Africa; where under the sanction of the witch-doctors, all multiple births are destroyed before a day is over, to do away with the ill-luck they are supposed to bring, and in some tribes the mother is put to death, and in some others both of the misguided parents are put out of the way along with their progeny—so that it is no exaggeration to say that the least skilled medical missionary who ever went among the heathen has more of the godlike and worship-worthy about him than the best god the tribes he visits can possibly produce. This is seen and appreciated in an espe-

cial manner in those lands where the foreign doctors extend their care to the lunatic and forlorn leper; the treatment of insanity among uncivilized peoples has been summed up under three heads, either neglect with starvation, death by torture, or burial while yet alive. What wonder, then, if these peoples mistake the educated physician for a god! One of the names adopted among the Chinese to describe a medical mission is "The Universal Benevolent Healing Office," and many a spontaneous gift finds its way from mandarin and merchant into the coffers of the hospital.

The Rev. Dr. MOFFAT, LIVINGSTONE'S father-in-law, has left on record a striking saying as to the value of a skilful medical man in foreign fields to the effect that "A medical missionary is a missionary and a half, or rather he is a double missionary." But now-a-days the converse is sometimes stated as the best method to insure success in the foreign fields, namely, medical missionaries should be sent forth not singly, but in pairs; in India especially, it has been found advantageous to have a female physician as one of the staff. The physician is almost always the first to gain a footing in any field that is entirely new. The sick heathen can appreciate a good dose of medicine even while as yet the language of his doctor is only dimly understood. And we believe it was the great LIVINGSTONE himself who many years ago, remarked that the best pioneer in a new and rude country was a well-filled medicine chest. MACKAY, of Uganda, who both administered medicine and did some surgery, often felt the need of a better acquaintance with the healing art and the companionship of a fully qualified medical comrade. So that the field of medicine is the world, the dark depths of Africa as well as the teeming fields of Asia.

CÆSAREAN SECTION TWICE PERFORMED IN THE SAME WOMEN. FOUR RECOVERIES.

One woman in France and another in Pennsylvania have, early in the current year, undergone Cæsarean section a second time. In other words, there have been four operations equally divided between two individuals; also four recoveries. To treat of the case of the foreign lady first: She was a resident of Pontoise, aged 24, the patient of a surgeon named CRIMAIL. She was not

rachitic, but had a pelvis that was uniformly contracted. Her first Cæsarean section was done in October, 1888, and the second in February last. In order to provide against the possibility of another pregnancy, the surgeon "unsexed" his patient by placing—during the second operation—a double ligature upon each Fallopian tube, a short distance from the uterus, and then divided the tubes between the ligatures. The uterus was then sutured, dressings treated with iodoform were used, and a good recovery resulted. The American case occurred in the practice of Dr. CHARLES P. NOBLE, of Philadelphia, and was reported by him to the Gynecological Society of Baltimore, in March, 1891. In this case Dr. HOWARD A. KELLY performed the first section. The uterine wound incompletely healed, and there remained a fistula from the cavity of the uterus to and through the abdominal wall. Notwithstanding this outlet, conception again took place. For several weeks the amniotic bag presented at the opening, so that during that time there was nothing between the foetus and the outside world but the thin amniotic sac. This sac ruptured at the thirty-third week. The patient had a generally contracted pelvis, and there was besides a mass of fibrous tissue behind the cervix, which had been left by the previous Cæsarean labor. If the patient had been left to Nature, the foetus must have been expelled per fistulam and not per vaginam. In performing the second operation, the fistula was enlarged to incision from below upwards; the peritoneal cavity was opened in order to obtain the necessary amount of room. A living foetus was extracted. The patient passed through this unique experience with satisfactory results as to the healing of the wounds; she is now in good health. Dr. NOBLE does not approve of the performance of any subsidiary operations for the purpose of preventing future pregnancies, as was done in the case of the French surgeon CRIMAIL; he would do nothing to prolong the section, and the deligation of the Fallopian tubes is objectionable, from a theoretical standpoint, as a possible cause for salpingitis. So far as is known to him, the ligature had thus been used only twice. Dr. NOBLE further stated that there had been twelve Cæsarean operations done in Philadelphia in the last four years, and ten mothers had recovered. One of the mothers who died had pneumonia at the time of the operation, and

in the other case of death there was a complication in the fact that the surgeon at the same time removed a fibroid tumor.

ANDROLOGY AS A SPECIALTY.

The first step in the right direction as far as the differentiation of the department of genito-urinary diseases into a separate and distinct specialty, was the formation of the Section of Andrology in the Congress of American Physicians and Surgeons. Much adverse criticism and some ridicule were excited by the nomenclature which the American Association of Genito-Urinary Surgeons constituting this Section finally adopted. But the American Andrological Association—now an important integral part of the Congress—is a complete success, and has demonstrated its ability to place the specialty of andrology upon as high a plane as that occupied by gynecology, ophthalmology, or dermatology. The parallelism between andrology and gynecology is especially well marked. The exigencies of general practice, which finally demanded the establishment of a department of surgery devoted exclusively to the study and treatment of diseases peculiar to women, are well recognized. The crude and imperfect work—and, we were going to say, surgical barbarity—characterizing this highly respectable special branch of surgical art prior to its differentiation into a specialty, are difficult to realize in the light of the magnificent work that is being done in this department at the present day. There is no question but that those affections peculiar to the male have been more neglected, less fully understood, and more frequently treated “for what there is in it,” rather than a desire to benefit the patient, than was ever true of the diseases of women. We believe that to-day fully as barbarous, slipshod, and dishonest work is being done in this class of affections as was ever to be observed in gynecic disease. Diseases of men have ever been the fruitful field of the quack and charlatan, and it must be confessed, that of certain physicians who in other directions, perhaps, may exhibit comparative honesty of purpose and practical skill. They have been the fruitful soil wherein the noxious principles of professional prejudice and popular ignorance have thrived and waxed luxuriant in the development of a crop of error, quackish pre-

tense, and incompetent surgery. Fostered by the indifference and neglect of the respectable physician, the practices of the quack have flourished like a poisonous fungus at the roots of the mighty oak of medical science. It is high time that a special association for the study of andrology should be encouraged by the sentiment of the profession at large. The time will come when the new departure in specialistic practice and nomenclature will be looked upon with quite as much favor as is gynecology to-day.

But andrology will never occupy the position it deserves until the average doctor ceases to think himself competent to treat the most complicated case of genito-urinary disease—as long as the patient's money lasts. There is no part of the body that so quickly and painfully resents incompetency and tinkering as does the genito-urinary apparatus of the male.

PHYSIOLOGY OF VOMITING.

There is no more common symptom of disease, with the possible exception of pain, than vomiting. It occurs in such a variety of conditions both general and local, and is, withal of such importance in the differential diagnosis of many morbid conditions, that clear ideas of the mechanism of its production are a desideratum. Our standard works on physiology present some rather wide discrepancies. FOSTER says that the varying impulses presented in the act of vomiting may best be considered as starting from a centre located in the medulla, near the respiratory centre. LANDOIS and STERLING state that the centre for the movements concerned in vomiting lie in the medulla oblongata. MILLS says that the vomiting centre is usually located in the medulla; he believes, however, that the doctrine of centres in its present form, especially with such precise limitations physiologically and anatomically, cannot be maintained. In this matter, he thinks we have been overlooking the connection of parts while occupied with defining their limits, and it is more than likely that our explanations of the entire process are quite inadequate to unravel its real complexity. HLASKO (Inaug. Dis. Dorpat., 1887) after a large number of experiments, came to the conclusion that there was no centre in the bulb, but that contractions of the cardia were determined by impulses pro-

ceeding from the corpora quadrigemina, the pathway was by the vagus and cord, especially the former. The efferent pathway for contraction of the stomach walls is wholly by the cord. In none of his experiments did any other portion of the brain determine contraction of the stomach excepting the corpora quadrigemina. An inhibitory centre for the cardia was found near the point where the nucleus caudatus joins the lenticular nucleus, not far from the anterior commissure. This dilator nerve forms part of the pneumogastric. It is well known that section of both vagi does not always suppress vomiting, though it makes the act difficult and imperfect. The experiments of HLASKO show that vomiting is absolutely stopped after the destruction of the corpora.

In view of the conflicting results obtained by experiments and the varying views of standard writers, it is too soon to formulate a theory regarding this one of the commonest but least understood of all the ordinary reflexes. Until the physiology of this function is better understood, it is folly to dogmatize regarding those complex disorders, sea-sickness and the vomiting of pregnancy.

VEGETARIANISM.

Numerous experiments have shown that a diet limited to certain articles of food is sure to result in the production of pathological lesions, the result of the malnutrition. These lesions show themselves early or late, according to the foods abstained from, and are tolerably characteristic for some foods or classes of foods. It is to be regretted that our observations have not been sufficiently extensive or definite to foretell accurately what particular symptoms will follow a particular starvation. It is well established that cattle deprived of common salt develop rough, shaggy coats, and later the hair drops out in spots; also that vegetable acid starvation results in scorbutus. The valuable observations of SALISBURY, made some years ago, have not yet met, at the hands of the profession, with the recognition that they deserve.

A note by DR. ALANUS, which has been going the rounds of the journals, has revived an old observation of one of the results of an exclusive vegetable diet, which should be borne in mind.

ALANUS had lived for a long time as a vegetarian, without feeling any better or worse than he had when using a mixed diet, when suddenly, although still under 40, he discovered that atheromatous degeneration was beginning to show itself, being particularly noticeable in the radial and temporal arteries. GUBLER had long ago shown that vegetable food, being richer in mineral salts than animal food, introduces more of these substances into the blood than animal food does, and that its exclusive use was followed by calcareous degeneration of the arteries. RAYMOND has observed numerous cases of atheroma in a monastery of vegetarian friars, amongst others, that of the prior, a man of 32, whose arteries were already considerably indurated. From Bombay and Calcutta, where many people live exclusively on rice, TREILLE, a naval surgeon, has reported many cases of atheromatous degeneration.

The importance of such observations does not lie in their showing the insufficiency of a limited diet, as that is already well known and accepted, but in the indications for feeding which they give in similar cases which develop irrespective of the diet.

THE INFLUENCE OF ONE FEVER ON ANOTHER.

Under this caption, DR. H. NOBLE JOYNT, of the Bradford Fever Hospital, gives some observations which he has made in the course of his wide experience in fever cases.¹ He remarks: "It is the daily experience, and indeed the bane, of every fever hospital physician to see a patient suffering from one fever, develop a second which has been incubating in his system before admission; or when convalescent, contract a fever from some other patient in spite of all precautions." Thus he has seen "mulberry rash of typhus, and the rose spots of enteric well developed at the same time; the erythema of scarlatina forming a brilliant ground for the vesicles of varicella, the dark maculæ of measles and rōtheln, and the rose spots of enteric."

Such observations are by no means new, but it has been the custom to deny that they are due to the presence of two distinct diseases in the individual, at the same time, but to assume that these appearances are more apparent than real, and

¹ Practitioner, XLVII, 261.

merely accidental manifestations of the original poison.

The dictum that but one infectious disease can exist in an individual at a time, has secured an almost universal acceptance, and has even dominated workers in original investigation, and yet it must be admitted that it stands only on clinical ground, and therefore is no more worthy of credence than the opposite view.

Now that it has been established that diphtheria is a local process, which produces its systemic effects through the poisons elaborated at the seat of the lesion, and absorbed therefrom, there can certainly be no objection, even theoretical, to the view of the old clinicians that diphtheria may be engrafted upon any of the infectious diseases.

Certainly the chemical poisons of diphtheria can be absorbed from a mucous surface by a patient affected with an infectious disease, as readily as the medicines administered can be absorbed, and there is no reason why their super-added effects should not be exhibited. When it has been shown satisfactorily just how many and what microorganisms can produce the disease or diseases known clinically as diphtheria, it will be time enough to determine whether the false membranes developed in the throat in scarlatina, typhoid and other diseases, are truly diphtheritic or not.

Why are not many of the symptoms of typhoid fever due to the absorption of poisons from the intestinal canal, intoxication complicating infection?

Concurrent varicella and scarlatina has recently received some attention at the hands of the French.

We have recently seen a child, who in the course of whooping cough, developed a typical enteric fever, during which the characteristic whoop ceased, to return on the cessation of the fever.

It is admitted that clinical evidence alone is not sufficient to establish the concurrence of two diseases, neither is it sufficient to disprove their concurrence. The apparent concurrence of two infectious diseases is not common, but to deny that such an actual concurrence is impossible, is going farther than exact observation warrants.

SOCIETY PROCEEDINGS.

Medical Society of Virginia.

The twenty-second annual session was held in Lynchburg, Va., October 6 to 8. Attendance about 200, including the following from other States: Drs. T. D. Crothers, Hartford, Conn.; A. M. Phelps, New York City; Chas. H. Shepard, Brooklyn; B. A. Watson, Jersey City; Wharton Sinkler, Philadelphia; H. P. C. Wilson, Thomas A. Ashby and J. J. Chisolm, Baltimore; I. S. Stone and Jos. Tabor Johnson, Washington, D. C.; Geo. H. Zimmerman, of Cranberry, N. C.; Geo. T. Vaughan, Surgeon U. S. Marine Hospital Service, at Evansville, Ind.

The President, Dr. Wm. W. Parker, of Richmond, Va., presided, and delivered a most unique, instructive and interesting *Presidential Address* on St. Luke and Jenner as physicians—showing their exemplary characters and pointing out the incalculable good they had done medical science, for which we in this day forget to give them credit.

A large and appreciative audience of ladies and gentlemen, beside members of the Society, was present on the first night to hear the address to the public and profession by Dr. C. M. Blackford, Jr., of Lynchburg, Va., on "*Medical Education as it Was; as it Is; and as it Should Be.*"

This address was followed by a most appropriate paper by Dr. Rawley W. Martin, of Chatham, Va., (who had been specially requested by the State Board of Medical Examiners to prepare it) on the

MISSION AND METHODS OF THE MEDICAL EXAMINING BOARD OF VIRGINIA.

The wonderful effects of the operations of this Board since its organization, January 1st, 1885, upon the education and tone of the Virginia profession; its now universally recognized benefits to the people of the State; its influence in leading colleges outside as well as in the State to do better work, and to require a better standard for graduation, etc., were all commented on. And the remainder of the address detailed the methods adopted by the Virginia Board in conducting examinations, etc. It is a valuable paper for general use.

The committee on examination of essays presented in competition for Dr. Hunter McGuire's prize of \$100, on the subject of "Pyelo-Nephritis," reported that in their opinion neither of the essays presented was entitled to the prize.

The subject for the prize essay next year is *Tetanus*.

Hereafter, in lieu of the usual reports on advances in the several departments of Medical Sciences, the president is to appoint fifteen Fellows, each of whom is to prepare an essay or lec-

ture on some subject of his selection, to be announced in ninety days after adjournment of the session.

After the routine work of the morning session of the second day, Dr. William W. Parker, of Richmond, Va., delivered the "President's Address," which was unique, classic, instructive and most entertaining. It was devoted mostly to a review of the lives of St. Luke and Jenner as model men and great physicians, and showed how much of good to humanity had resulted from their labors as doctors.

ACUTE AND CHRONIC DYSENTERY,

Was the subject for general discussion. The leader, Dr. P. B. Green, of Wytheville, Va., briefly reviewed the literature of the causes, symptoms and pathology of the disease, but devoted the bulk of his paper to the questions of treatment. The "laxative and opium plan," he said has pretty generally fallen into disuse. The "antiphlogostic plan" is admissible only in sthenic cases, which are extremely rare. The "continuous use of large doses of calomel" seems unnecessary. When such doses are "followed by salines," depression is apt to follow. However, one or two decided doses of calomel are indicated if the condition of the patient is "bilious." "The saline laxative plan" is undoubtedly beneficial in the earlier stages of the catarrhal variety. "Castor oil in repeated doses" has warm advocates. The "opium treatment" to the stage of semi-narcosis is unsafe. "Ipecac treatment" is extravagantly commended by many. It is best to administer it in wafers or capsules. Dr. Green, however, has not used ipecac with very satisfactory results. "The antiseptic mode" promises more than any other. Among agents used are iodoform, salicylic acid, cupric sulphate, boric acid, carbon-bisulphide water, creosote, naphthalin, bichloride of mercury, salicylate of sodium, resorcin, etc. Sodium salicylate seems to be the preferred. Beaumetz gives

R. Carbon bisulphide, ℥vi.
Water, ℥xvi.
Spts. peppermint, gtt. xxx.—Mix.

Shake well; let settle. Then take 8 to 10 tablespoonfuls, diluted with milk or water, during the day. If the disease continues a week without improvement, the suppurative stage has probably set in. Then an emulsion of turpentine, such as the following, has acted well in his hands:

R. Tinct. of opium, ℥ij-iv.
Oil of turpentine, ℥iiss.
Gum Arabic, (powdered).
White sugar, āā ℥ss.
Camphor water, ℥ij. Mix.
S. Teaspoonful every four to six hours.

Astringents may now be required, such as drugs containing tannic or gallic acid, carbolic

acid, acetate of lead, sulphate or chloride of zinc, and nitrate of silver. If severe hæmorrhage sets in, he uses ergotole or ergot hypodermically. "Treatment by rectal injections" has invariably proved successful in adult cases in his hands, and in most cases of children, except infants. He prefers a fountain syringe, filled with a warm solution of mercuric bichloride (1 : 10,000 up to 1 : 3,000) every six to twelve hours. Immediately after this injection into the bowel, let patient evacuate the bowels, and introduce a suppository of opium. Among other antiseptics so used are salol, Listerine, fluid extract of hydrastis, salicylic acid, the salicylates, etc.

In a paper on the subject by Dr. Wm. J. Crittenden, of Unionville, Va., the frequency of dysentery in both the Union and Confederate armies during the Civil War is commented upon. Along the Pacific coast, its frequency is stated to be in the proportion of 1 : 1,000 deaths from all causes; on the Atlantic coast, 10 : 1,000; along the Mississippi River section, 21 : 1,000. Warm climates furnish the soil for the dysenteric germ. After describing the anatomical and clinical histories of the disease, he spoke of the complications, such as peritonitis, perityphlitis, intussusception, intestinal perforation, liver troubles, etc. He described the various modes of treatment, prophylactic and curative.

Dr. Bedford Brown, of Alexandria, Va., followed with a paper on

DYSENTERY VIEWED AS A SEPTIC DISEASE, AND TREATED PRINCIPALLY BY ANTISEPTICS.

Leaving out of consideration those cases due simply to irritants, etc., he spoke of the septic forms, heretofore designated as malignant, camp, jail, famine, typhoidal dysentery, etc. Foul conditions of food, water or air are the common causes of this septicæmic form. Its mortality ranges from 75 to 25 per cent. Absolute and continuous cleanliness of the drinking-water, of food, and of the air breathed, is the preventive. In the septic form of dysentery, begin treatment with calomel as a cathartic, followed by Epsom salts to thoroughly cleanse the alimentary canal. Then use injections of carbolic acid ℥ij in 2 or more pints of water. This may be followed by an anodyne enema of a drachm of laudunum. Then

R. Aromatic sulphuric acid, ℥ij.
Sulphate of magnesia, ℥ss.
Deodorized tincture of opium, ℥ij.
Syrup of orange peel, ℥j.
Peppermint water, ℥ij.
Water, ℥ij. Mix.
S. Tablespoonful every three hours.

An occasional full dose of Epsom salts relieves engorgement and corrects the secretions. A more decided antiseptic course is required in severer cases—such as naphthalin, salol and phenacetin, āā gr. v, every three hours, and irrigation of the

bowel twice daily with creolin. If adynamia supervenes, with intensely offensive bloody discharges, with mucus, pus, sloughs, etc., hydrogen peroxide—an ounce or two in a pint of water as an injection—is the best antiseptic, or ichthyol dissolved in mucilage. Sustaining diet must be used. If collapse threatens, give $\frac{1}{100}$ gr. each of atropia, strychnia and nitro-glycerine, beside hypodermics of caffeine. In malignant hæmorrhagic forms:

R. Opium, gr. ss.
Tannin, gr. ij.
Strychnia sulphate, gr. one-fiftieth.
Iodoform, gr. j.
Creosote, gtt. j. Mix.

S. Repeat every two or three hours. Also give turpentine, \mathfrak{z} ss, in a pint of emulsion.

Chronic dysentery should be considered as due to septic wounds. The septic fæcal matter constantly passing over the wounded surface keeps up the condition. Use simple tepid water irrigations; then use, twice daily, $\frac{1}{2}$ to 1 gallon of solution of hydrogen peroxide, creolin or ichthyol. A soft rubber tube, about 15 inches long, passed into the colon, is the most efficient means of irrigation.

Dr. J. Edgar Chancellor, of the University of Virginia, instanced some remarkable cures of chronic dysentery by the use of the Rockbridge alum springs water.

Dr. R. I. Hicks, of Warrenton, Va., had not succeeded with antiseptic irrigations. At the same time, locking up the bowels with opium had been fatal, although opium is useful to provoke sleep, especially if associated with a suitable laxative. With such treatment, he had thirty-three successive cures; whereas of fifteen cases treated by irrigations, he had one death.

Dr. D. A. Langhorne, of Lynchburg, Va., agreed with Dr. Hicks about irrigation. The calomel purgative treatment is too risky, and opium is positively harmful. Rockbridge alum springs water is especially valuable in those chronic cases having pale, flabby tongue, etc.

Other speakers were Drs. R. M. Slaughter, of Theological Seminary; W. L. Robinson, of Danville; H. M. Nash, of Norfolk; J. S. Apperson, of Marion; J. E. Anderson, of North Danville—all of Virginia.

During the afternoon, the following elections for the ensuing annual term were made: President—Dr. H. Gray Latham, of Lynchburg; Vice-Presidents—Drs. J. R. Gildersleeve, of Tazewell C. H., Hugh Stockdell, of Petersburg, and B. Moore, of Aylett's; Secretary—Dr. Landon B. Edwards, of Richmond; Corresponding Secretary—Dr. J. F. Winn, of Richmond; Treasurer—Dr. Richard T. Styll, of Hollins; Chairman Executive Committee—Dr. Hunter McGuire, of Richmond; Chairman Committee on Applicants or Fellowship—Dr. Wm. D. Turner, Fergusson's Wharf, Isle of Wight Co.; to fill vacancies on

Medical Examining Board of Virginia—Drs. Kent Black, of Blacksburg, and Wm. S. Christian, of Urbanna. To deliver "Address to Public and Profession, 1892"—Dr. Jacob Michaux, of Richmond. Subject for General Discussion, 1892—"Vertigo;" Leader—Dr. E. T. Brady, of Marion. Luray is place of session, 1892, during second week in September.

Preceding elections, invited guest Dr. A. M. Phelps, of New York City, operated on two cases of club-foot, and afterwards made a clinical lecture on the subject. His operation on the boy of about 13 years, for a congenital and very disfiguring talipes equino-varus, excited special commendations, as being a most difficult operation well performed, etc.

During the night's session, invited guest Dr. Charles H. Shepard, of Brooklyn, N. Y., read a paper on

THE TURKISH BATH IN THE TREATMENT OF DISEASE.

The essential principle involved in this bath is "the application of heat in varying temperatures," to quicken circulation and excite perspiration. Manipulation or massage follows the bath. "The Turkish bath is a prime element in preventive medicine," and belongs in the first rank of remedies for rheumatism, malarial troubles, etc. It substitutes climatic influences when they are needed—removing congestion, inflammation, equalizes circulation, and imparts activity to the secretory organs. The paper was favorably discussed by Drs. T. D. Crothers, of Hartford; L. G. Pedigo, of Roanoke; E. T. Brady, of Marion; Geo. W. Hubble, of Chilhowie, etc.

Dr. S. J. Baker, of Bedford City, Va., read a paper on *Pharmacy and its Practical Relations to the Profession*, its scope being set forth in the title.

During Thursday morning's session, Dr. H. P. C. Wilson, of Baltimore, fraternal delegate, etc., read a paper on

RETRO-DISPLACEMENTS OF THE UTERUS.

Retroflexion is the most common, and sooner or later leads to serious symptoms in other organs, as of bladder, stomach, heart, brain disease, etc. Removal of the chronic retroflexion does not promptly relieve the symptoms referred to. Judicial constitutional treatment as well as treatment of the organs which have suffered are essential. To diagnose retro-displacements, empty the lower bowel; pass *left* index finger per vaginam, knuckles down to depress perineum which permits the finger to reach higher. The woman being on her back on a table, with thighs flexed on her abdomen, and legs on thighs, the finger can usually determine whether or not the fundus uteri is back in the hollow of the sacrum. Sim's left lateral position is the best for the use of the probe. Introduce Sim's speculum; steady cervix with tenaculum, and introduce the probe

to determine the amount of fixation, the direction of the uterine canal, etc. If the retro-displaced uterus be of recent duration and movable, it can usually be easily replaced and held in position with a comfortable pessary. In the after treatment, wash out the vagina daily with hot water, and also see that the bowels are opened every day. Constipation is the rule in all these cases. So that he has almost come to the conclusion that the end of woman is to serve God, and keep her bowels open. If the pessary is uncomfortable, remove it at once; but if comfortable, do not remove it until long after its use is deemed unnecessary. When then removed, substitute a smaller one, until the patient can do without any. The pessary should be long enough and sufficiently curved to raise the fundus uteri out of the sacral hollow, and carry it forward to its natural position; but it should not be so wide as to put the lateral vaginal walls on the stretch. When irritability and sensitiveness prevent complete restoration, replace the womb only partially, and hold it so until the wearing off sensitiveness permits its being more perfectly replaced. A pessary is usually required for two or three years. If the vagina chafes or becomes unduly irritated, remove the pessary for the time, introduce Sim's speculum, and touch the abrasion with a weak solution (1:12) of Monsel's solution and glycerine, and use a fresh pad of aseptic lamb's wool till the pessary is re-inserted. Hodges' or Smith's bow pessary are best for retro-displacements.

Invited guest, Dr. Joseph Taber Johnson, of Washington, D. C., remarked that Dr. Wilson's paper was a capital one in all its descriptions. The greatest caution should be urged about the use of the pessary if inflammation exists. If such a condition as a fibroid in the posterior wall causes retro-displacement, of course the pessary will not be sufficient—surgical aid must be summoned. To use the probe simply to determine the course of the uterine canal is harmful in many cases. The womb is intended to be a movable organ; hence to apply a pessary that fixes it in one position will result in injury.

Dr. L. Lankford, of Norfolk, Va., said that in some cases of seemingly extensive and firmly adherent retro-displaced uteri, he had done good by first swabbing out the vagina with mercuric bichloride solution (1:4000), and then applying a tampon (about once in five days) of selected lamb's wool wet with the same solution. If required, steady the cervix with a tenaculum while passing the tampon into the uterine cavity. Then throw into the vagina and all over the cervix uteri a powder of iodoform (one-third) and bismuth subnitrate (two thirds). Sometimes he uses boro-glyceride instead of the above. A pessary made of marine lint (which is aseptic) is then introduced.

Dr. I. S. Stone, of Washington, D. C., commended Dr. Wilson's paper for its cautions as to the use of pessary and probe. Various ovarian diseases and peri-uterine inflammatory adhesions are the most frequent causes of chronic retro-displacements; but it is obvious that no pessary can remove such causes. Some patients express themselves as feeling better after the doctor in whom they have confidence does anything looking to their relief. Thus pessaries are often beneficial in the way of favorable mental impression. But when a pessary does not cure in a short time, then remove it and substitute another treatment. He had recently removed a pessary from a lady in whom it was inserted some years previously while she was in Japan. The pessary had most probably excited the growth of the three fibromata which he found attached to the uterine wall.

Dr. R. M. Slaughter, of Theological Seminary, Virginia, reported a case of long wearing of a pessary.

Dr. Wilson closed by emphasizing some of the points he had made.

Dr. H. M. Nash, of Norfolk, Va., presented an admirable review of *Advances in Obstetrics and Diseases of Women and Children*.

Invited guest Dr. Thomas A. Ashby, of Baltimore, presented some personal

OBSERVATIONS ON THE ETIOLOGY AND PATHOLOGY OF THE DISEASES OF THE PUERPERIUM.

In no case of puerperal metritis, peritonitis or septicæmia examined had he failed to find evidence of cervical laceration; the same is true with reference to cases of tubal diseases that had come under his observation. He remarked upon the different morphological characteristics, as well as clinical histories, lesions, etc., produced by the different microorganisms which enter the vagina. The germ of putrefaction produces a distinct sapræmia, while the germ of suppuration develops true septicæmia or pyæmia. Bacteria termo generate ptomaines or leucomaines, which enter the blood and produce putrefaction. On the other hand, micrococci, chain-bacteria or streptococci of wound infection are believed to be identical, as they flourish in the blood and multiply so rapidly as to cause the most profound toxæmia. Thus it will be seen that most of the diseases to which he has referred are preventable by thorough asepsis.

In the paper on

PUERPERAL ECLAMPSIA

by Dr. J. T. Graham, of Wytheville, Va., it was shown from a study of 180 cases that the time honored theory that albuminuria is a cause of puerperal eclampsia is not true in every case. He treated the subject in four divisions. 1. Albuminuria without eclampsia; 2. eclampsia without albuminuria; 3. the conditions of the kid-

neys during pregnancy; 4. the products of intestinal putrefactions. In the first division it was proven from statistics that the majority of cases of albuminuria during pregnancy do not result in convulsions; under the second division it was stated that cases of eclampsia have often been known where no albumin was found in the urine. The theory of obstruction to the free flow of the urine by pressure of the gravid uterus upon the kidneys, their blood vessels and ureters is dwelt on in the third division; but particular attention is called to the fourth division, viz.: *the absorbed soluble products of intestinal putrefactions*. Constipation is the rule in the pregnant woman and putrefaction of the contents of the large bowel is more liable to occur, the products of which are absorbed, more or less, and are poisonous. This is especially dangerous if the kidneys are not active enough to eliminate these poisons from the blood.

The treatment is prophylactic, sedative and eliminative. The first is considered most important. It is suggested that as soon as a woman knows she is pregnant she should be under the care of a physician who should regulate her diet, clothing, exercise, etc., and keep her skin, kidneys, and bowels active. Many physicians are too careless about the examination of the urine of pregnant women. The sedative treatment consists in the use of bromides, chloral hydrate, morphine, chloroform, and veratrum viride. The eliminative treatment consists of diuretics, diaphoretics, hydragogue, cathartics and venesection.

SYMPTOMATOLOGY AND TREATMENT OF CHRONIC FORMS OF NEPHRITIS.

As a summary of the paper by Dr. Wm. C. Dabney, of the University of Virginia on this subject, he itemized the following conclusions:

1. Dropsy is often absent in cases of chronic Bright's disease.

2. The symptoms which, when not clearly due to other causes, should suggest an examination of the urine and cause a suspicion of Bright's disease are: 1. Pallor or a dark color of the skin of the face. 2. Nausea and vomiting. 3. Headache and giddiness, drowsiness, dulness, stupor or convulsions. 4. Disturbances of vision. 5. Paroxysms of difficult breathing.

3. Albuminuria and the presence of casts are not invariable symptoms of chronic Bright's disease, but are often absent in the most serious cases.

4. The amount of solid urine discharged is diminished in all cases.

5. A milk diet and the avoidance of cold and dampness are of the greatest importance in these cases.

6. Digitalis is useful when the flow of urine is scant, and the pulse soft and compressible.

7. Nitro-glycerine is useful when the pulse is full and hard.

8. Nitro-glycerine and digitalis may often be given together with advantage.

CONCUSSION OF THE LUNGS

was the subject of a paper of rare interest by invited guest Dr. B. A. Watson, of Jersey City, N. J. He uses the term "concussion" in precisely the same sense as it is used when speaking of the brain as the seat of the concussion lesions, allowing for differences in the weight and texture of the organs involved. His paper is based on a study of 141 original experiments. He considered his subject under the following subdivisions: 1. An organic disturbance attended with slight pathological lesions, not characterized by any consecutive complications. 2. A severe organic disturbance, attended with severe pathological lesions, characterized by physical and rational symptoms, and commonly followed by consecutive complications which are generally inflammatory. 3. A grave organic disturbance, attended with grave pathological lesions, frequently producing death within a few minutes or a few hours. Indirect concussive force is much more productive of serious lesions in the thoracic, abdominal and pelvic organs than to the brain or spinal cord.

Dr. I. S. Stone, of Washington, D. C., read a paper giving an account of an interesting

MYOMECTOMY FOR PARASITIC TUMOR.

The patient, an unmarried woman of 35 years, had noticed the growth for several months, but was not greatly inconvenienced by its presence. She was somewhat emaciated, had decided albuminuria, and her abdomen gave the appearance of pregnancy at the eighth month. The operation was not particularly difficult, the chief interest lying in the development and attachments of the growth. It had a slender attachment or adhesion to the uterus posterior to the fundus, and this indicated its birthplace. Its diminished nutrition being interfered with at this time, a new base or pedicle was formed on the posterior surface of the right broad ligament. The uterus, tubes and ovaries were quite normal in appearance, and were not disturbed. The pedicle was treated as suggested by Schroeder for hysterectomy, it being too short to fasten in the wound. The patient made an excellent recovery, and continues well.

THE TREATMENT OF GOITRE BY ELECTROLYSIS, was the title of a paper read by Dr. Chas. M. Shields, of Richmond. In the cases reported he used the *labile* method or application of the electrodes to the surface of the skin without puncture.

One of the cases was of the simple glandular form, three of fibro-cystic. All had been treated before by the usual means such as iodides, blisters, hypodermatic injections, setons, etc., without im-

provement. By the means of electrolysis three were cured and the fourth reduced to one-third its original size. The sittings were from two to six days apart, and from fifteen to thirty Leclanche cells.

Dr. W. H. Baker, of Lynchburg, Va., read an interesting and instructive historical paper, giving *A Glimpse of Ancient Egyptian Ophthalmology*.

Dr. Joseph A. White, of Richmond, Va., presented two papers—one on *Mistaken Impressions about so-called Nasal Catarrh*, and one on *Some Suggestions about Cataract Operations*.

Invited guest, Dr. Wharton Sinkler, of Philadelphia, read a paper on *Hereditary Chorea*, and reported three additional cases. He also read the details of an autopsy made in a case previously reported. The result of the examination showed no gross changes in the brain or cord, but microscopic examination of the cord revealed very distinct changes about the central canal and degeneration in the antero-lateral columns.

Dr. William F. Drewry, first assistant, Central Lunatic Asylum, Petersburg, Va., presented a resumé of the progress made within the past year, in

DISEASES OF THE MIND AND NERVOUS SYSTEM.

The literature, during the year, on neurology and psychiatry has been voluminous. Our knowledge of almost every known neurosis has been broadened and made more thorough. Microscopy has accomplished wonderful results. Neurology is in its infancy, so to speak. *Inebriety* is frequently a disease of the nervous system, and if dealt with as such, the results would be far more satisfactory than at present. Heredity has a great influence in causing it, as also many other affections of the nervous system. The treatment, though a difficult problem, should be put into the hands of scientific medical men. It can best be carried out in a well regulated retreat, where suitable employment, exercise, proper medication, etc., could be enforced. Instances of neuroses and psychoses following la grippe had been numerous. Melancholia was frequently a sequel. The author had carefully studied the statistics of general paresis and stated that 3 per cent. of all patients admitted to forty-four insane hospitals in this country in 1890 (representing every section), were cases of general paresis. Males predominated seven to one over females. Negroes very rarely had the disease. In the Eastern, Middle and New England States, the percentage of paretics was 4.2 of all admitted to hospitals during the year named. In the manufacturing districts the paretics constituted about 8 per cent. of cases of insanity. In the Southern States 2.7 per cent. of the insane were paretics. In the Western and Pacific States, 2.1 per cent. No class was exempt from this disease. It was by no means confined to brain workers. The

most prolific causes are alcohol, and general mental and physical overwork. Sulphonal as an hypnotic for the insane, was second to chloral hydrate. It had also been employed with success in the quieting of maniacal excitement, controlling spasms, convulsions, etc. It is useful in many nervous troubles.

Dr. T. D. Crothers, of Hartford, Conn., present by invitation, discussed

THE DRINK PROBLEM FROM A MEDICAL POINT OF VIEW.

The hereditary tendencies to the disease of inebriety were forcibly pointed out. To treat the disease, therefore, is to correct the hereditary tendency. Treat everything as dangerous to man and as criminal which perils human health and happiness. Drunkards and drinkers should be considered as dangerous to others in society, and thus absolutely isolated in hospitals, etc. Give them employment and thus make them pay the expenses of their own support. If then such hospitals cannot be self-sustaining, tax the manufacturer and seller of spirits enough to do so.

Dr. J. T. Graham, of Wytheville, Va., in a paper on *What is to be Done With Our Criminal Insane?* advocated that murderers adjudged insane be confined for a period of years. If guilty, the punishment is light enough; if insane, then they should receive the benefit of hospital treatment. To let an insane murderer loose on the community until after a long period of established cure, is dangerous to the unsuspecting.

Mississippi Valley Medical Association.

Seventeenth Annual Meeting, held in St. Louis, Missouri, October 14, 15, and 16, 1891.

FIRST DAY—MORNING SESSION.

The Association convened in the Pickwick Theatre, and was called to order at 10:30 A.M. by Dr. I. N. Love, Chairman of the Committee of Arrangements.

Prayer was offered by Bishop D. S. Tuttle.

The Address of Welcome was delivered by Hon. E. A. Noonan, Mayor of St. Louis, which was followed by brief addresses on the part of the Missouri State Medical Association, by Dr. W. B. Outten; the St. Louis Medical Society, by Dr. Ludwig Bremer, its President, and appropriate remarks by Drs. Harold N. Moyer, and J. C. Culbertson, of Chicago.

After the report of the Chairman of the Committee of Arrangements, which was an interesting and attractive one, Dr. C. H. Hughes, of St. Louis, took the chair and declared the Association ready for the transaction of its scientific work.

The first paper was read by Dr. W. Carroll Chapman, of Louisville, on

THE TOXIC EFFECT OF TOBACCO VAPOR, WITH REPORT OF CASES.

He said that usually the presence of tobacco poison in the systems of tobacco workers is manifested during the first day or two by violent vomiting, retching, purging and often a state of collapse, after which the system may become injured to it. Occasionally we find one whose constitution, even by contact and time, although there is a certain amount of toleration, refuses to receive it kindly, and emaciation begins, attended sooner or later by such symptoms as the following case illustrates:

Case 1.—Willie C., aged 10 years, was found suffering extreme pain in the abdominal region, with the intensity centering at the umbilicus. Temperature, under the tongue, 100°; pulse 108, small, wiry and irregular; respiration 20 to 22, but irregular—several short, shallow respirations followed by one deep and gasping. Tongue bluish, red appearance and pointed. Patient constipated for the last several days; abdomen flat or rather depressed; urine scanty and slightly colored; skin dry, as were the hands and feet, the latter being a little cold. When near the patient the odor of tobacco was so pronounced that the doctor made inquiries regarding it and learned that he worked in a tobacco steamery and further, that he had slight attacks of similar pains at several different times except of a milder form. As to the nicotianin, indications point strongly to its being a cause. According to Landerer it occurs only in dried tobacco leaves, and has the odor of that plant; a point strongly in its favor, as that odor was so distinct in every case the author had seen. It would seem further, that the basic substances and fatty acids were causative agents, because authors have proven, by physiological experiments, that these cause contraction of the pupil, dyspnoea, abdominal pains, convulsions and death.

The author directs attention to two factors noticeable in all the cases, namely: the emaciation, and the time each one had followed the occupation, that is, from six weeks to three months. In the three cases which he reports had not suffered from the vomiting and retching usually attendant upon young tobacco workers the first day or two. In the other, or milder cases, he selected to enquire regarding that point.

The toxic effects of tobacco vapor and its treatment was a subject worthy of more consideration than the profession has accorded to it in the past, and he hoped that the next few years, aided by diligent and careful investigation, would place the matter in a more intelligent light.

AFTERNOON SESSION.

Dr. Robert C. Kenner, of Louisville, Ky., read a paper on *The Treatment of Typhoid Fever*, in

which he directed particular attention to the cold bath treatment.

Dr. William Warren Potter, of Buffalo, followed with a paper entitled

PELVIC INFLAMMATIONS IN WOMEN; A PATHOLOGICAL STUDY.

The author affirmed that pelvic inflammations and their residues constitute about one-third of the diseases that gynecologists treated, hence the importance of frequent discussions of all moot questions relating to the subject. He briefly reviewed the anatomical relations of the pelvic organs, calling attention to their enormous blood and nerve supply, which became both their weakness and their strength.

He contrasted the pathology of Bennet (1843) with that of Emmet (1873), and the latter with the teachings of Price, Tait, Hegar and McMurtry, of the present age. He referred to the pathological studies of Bernutz and Goupil, of thirty years ago, and affirmed that the observations of the present had served to confirm the correctness of those pioneers.

He next asserted that the pathology of to-day had been established by operative surgery, which had shown that pelvic inflammation begins in the tubes or ovaries, and extends to adjacent structures, through absorption or by contiguity; that it almost never begins in the cellular tissues, but may be carried there through the tubes and ovaries by infections, either specific, puerperal or traumatic. He affirmed that the inflammation was in most cases a peritonitis, intra-pelvic or local in character, and not a cellulitis; that parametritis and perimetritis were misleading and confusing terms, hence should be dropped; and that the so-called pelvic abscess was a sequence of salpingitis, oovaritis or peritonitis, not a primitive accumulation in the areolar tissue itself.

The tentative management in these cases—rest, counter-irritation, hot sitz baths, vaginal douches, and attention to the digestive organs and general health—resulted in only temporary improvement, or in cure in a very small percentage. Those reported cured were generally, if the history could be known, subject to repeated relapses; and a frequently recurring pelvic peritonitis usually indicated leaky tubes. Electricity, too, had disappointed even its most sanguine advocate, and need not be considered.

In conclusion, he asserted that if these views be accepted, the logical deduction was to watch the early manifestations of the disease carefully, that competent surgical skill be invoked before the damage to important structures becomes too great to justify the expectation of successful operation.

Dr. Geo. F. Hulbert, of St. Louis, read a paper on *The Nervous Equation of Pelvic Inflammation*.

Dr. L. T. Riesmeyer, of the same city, con-

tributed a paper entitled *Pathology and Surgical Treatment of the So-called Strumous Inguinal Lymphadenitis*.

SECOND DAY—MORNING SESSION.

The Association was called to order by President Hughes at 10 A.M.

Prayer was offered by Rev. Dr. S. J. Niccols, of St. Louis.

Dr. Rufus B. Hall, of Cincinnati, Ohio, read a paper on *Complications During and Following Abdominal Operations*.

Dr. Arch Dixon, of Henderson, Kentucky, followed with a paper entitled

GASTROSTOMY FOR IMPERMEABLE STRICTURE OF THE CARDIAC END OF THE ŒSOPHAGUS; RECOVERY; SUBSEQUENT DILATATION OF THE STRICTURE.

On July 14, of the present year, Dr. Thomas W. Taylor consulted him in regard to a patient who was unable to swallow anything save liquid. The patient, Captain S., aged 54, weight previous to difficulty in swallowing, 230 pounds, at the time of examination 156 pounds. Examination by means of œsophageal bougie (smallest size) revealed the fact that complete stenosis of the œsophagus existed at the cardiac end. Repeated trials failed to pass the stricture, and the patient was informed that only an operation, the nature of which was explained to him, could prevent his death from starvation. Operation was declined. Again on July 29, the patient consulted him, and after persistent effort he failed to pass the stricture with the smallest bougie. The patient was requested by the author to go before the Henderson County Medical Society, which held a meeting that afternoon, and be examined. To this the patient consented and again an attempt was made to pass the stricture by a number of physicians present, without success. A statement of the case was made by Dr. Dixon, and the unanimous opinion was expressed to the patient that only an operation could save his life. The patient had by this time grown much weaker and was reduced in flesh to 140 pounds. The operation was consented to and on August 4, at the Home Mission Sanitarium, assisted by Drs. John Young Brown, W. M. Hanna, W. S. Stone, A. J. Lieber, and T. W. Taylor, Dr. Dixon did a gastrostomy after Hecker's method, as follows:

The patient was prepared in the usual way, the field of operation being made as nearly aseptic as possible. Chloroform was administered by Dr. T. W. Taylor. The incision was made four inches long, beginning one inch below the ensiform cartilage and an inch and a half to the left of the median line; the peritoneum was reached, caught up between forceps and divided the full length of the incision. The index and

the middle fingers were inserted, the transverse colon pushed downward and the stomach reached without difficulty; a fold was caught between the fingers and partially drawn through the wound, where it was held by Dr. Brown, while a careful search was made for the cardiac end and to detect, if possible, any tumor or enlargement which might be the cause of the stricture; none could be discovered. A silver pin was now passed through the fold of the stomach, which was drawn through the wound, a little above the level of the skin, care being taken that the pin pierced the mucous membrane, as suggested by Weir, thus forming a support for the stomach in the wound and serving as a guide when the opening should be made into it to show that the cavity was reached. The pin was about three inches long and rested on the skin on either side of the wound; the peritoneal coat of the stomach was now stitched to the peritoneum by a continuous suture, which on either side of the wound included the skin. The peritoneum above and below was brought together by interrupted sutures, which embraced muscle, fascia and skin as well.

The wound was now covered with iodoform collodion over which iodoform gauze was placed, confined by adhesive strips. The opening into the stomach was purposely deferred until adhesions should have formed. The patient recovered from the effects of the anæsthetic well. There was some pain of a darting character, which was relieved by hypodermic injection of morphia $\frac{1}{4}$ gr., and atropia $\frac{1}{750}$. The operation was finished at 11 A.M. At 6 P.M. temperature was 99; pulse 78. August 5th, temperature 98½; pulse 72. Temperature and pulse remained normal until the morning of August 7th, when the dressing was removed.

A few drops of cocaine were injected into the fold of the stomach which protruded through the wound and the gastrostomy was completed by cutting down upon the pin with a tentome. As in Weir's case, the presence of the pin was a valuable guide in showing beyond question that the cavity of the stomach had been entered. There was no hæmorrhage of moment. The adhesion being firm, the pin was withdrawn and the mucous membrane was drawn up and stitched to the skin. A rubber tube was now passed into the stomach through the opening fitting it snugly. Iodoform collodion was liberally used around the tube and over the abdominal wound. Iodoform gauze folded several times, through which a hole was cut for the tube, came next, covered by a piece of rubber sheeting. Borated cotton held in place by adhesive strips completed the dressing. The tube was kept *in situ* by a thread passed through it above and below, and the three held in place by adhesive strips. Peptonized milk, one-half pint with a teaspoonful of Mergens Quera's beef-meal was now injected through the

tube into the stomach by means of a large syringe. An ordinary spring clothes pin was used as a clamp for the tube. Six hours later another one-half pint of milk with the beef-meal was thrown into the stomach, the patient experiencing a satisfaction which had not been experienced previously from the use of nutritive enemmas. Temperature at 8 P.M. reached 101°. At 10 A.M., August 8th, it had again fallen to normal. The feeding was continued at intervals of six hours, the food being varied in character; chopped meat, eggs, bread, etc., the patient having an aversion to brandy, and would take no stimulant of any character. Improvement was steady and in ten days the patient was out of bed. In two weeks he was walking about the house, and in three weeks was down in the city, a distance of one-half mile from the Sanitarium.

On the 29th day of August, twenty-four days after the primary operation, and twenty-one days after the stomach was opened, Dr. Dixon determined to try dilatation, and was agreeably surprised to find that the smallest size, olive-pointed bougie entered the stomach, passing the stricture without difficulty; a size larger was now used and it passed also without force.

The following day a large stomach tube was passed down the œsophagus, and with little difficulty entered the stomach. Dilatation was continued at intervals of a few days. From liquid food the patient soon essayed some solid food, and on September 10 took his first square meal, which consisted of oysters, broiled beefsteak, coffee, eggs and bread. The patient left the Sanitarium, and he was thinking seriously of closing the abdominal opening, or allowing it to close. On September 23, the patient, who made daily visits to his office, complained again of difficulty of swallowing solid food; especially was there difficulty in swallowing bread. The bougies passed the stricture easily on entrance, but on withdrawal there was a decided hitch, even the smallest bougie was caught slightly when withdrawn. Dr. Dixon at first attributed this to spasmodic action, but the difficulty grew greater and greater, until finally he could no longer enter the stomach by way of the œsophagus with a bougie. Liquids could still be swallowed, and found their way into the stomach. He now determined to try retrograde dilatation, and on September 30, assisted by Dr. John Young Brown, he succeeded in finding the cardiac end of the œsophagus and entering it with a very small bougie a boula. The opening was about the size of a very small shirt buttonhole, and felt much like the meatus urinarius in a girl; it was surrounded by a hard tissue, feeling much like a fibroid. A uterine sound was next properly bent and, with the finger as a guide, passed into the œsophagus; this was followed by a uterine dilator. Slight pressure on the handles opened the blades almost half

an inch, but the patient experienced so much pain that it was deemed best to desist. The following day chloroform was administered and retrograde dilatation was accomplished, first by means of G. Wylie's uterine dilator, the use of which enabled him to enter the orifice with a large-sized bougie (rectal).

Up to this time he had not been able to determine whether the stricture was due to malignant trouble or not, but on passing the finger into the non-dilated œsophagus, a friable, irregular growth was detected, which easily broke down and bled rather freely. A piece of this growth was twisted off by forceps, and was sent to Formad, of Philadelphia, for examination. Since the dilatation the patient has been able to swallow solid food without much difficulty, and has notably improved in flesh and strength, and is able to attend to some business.

The author wished to acknowledge his indebtedness to Dr. Robert F. Weir, of New York, for many valuable suggestions, both in the performance of the operation and in the management of the case afterward, gleaned from his report of a similar case published in the *Medical Record*, July 25, 1891.

Dr. Dixon also exhibited the patient to the Association.

Dr. L. Ch. Boisliniere, of St. Louis, exhibited a new obstetric forceps of his own design.

(To be concluded.)

Golden Belt Medical Society of Kansas.

The regular quarterly meeting of the Golden Belt Medical Society of Kansas, was held in Abilene, Kas., October 8, 1891.

DR. WILLIAM B. DEWEES, President, in the chair, called the meeting to order at 4 P.M. After the general order of business was passed over, Dr. Ed. E. Hazlett, of Abilene, Kas., read a paper on

NEUROSIS OF THE EXTREMITIES,

and reported the case of Dr. King, of Abilene, first president of this Society, whom he brought before the meeting for inspection, as a great sufferer from what may be termed "Metatarsal Neuralgia," for want of a better terminology. The President suggested that, there being no objection, Dr. J. C. McClintock, of Topeka, kindly consent to examine the case of Dr. King before this Society. No objection being offered, and Dr. McClintock consenting, about fifteen minutes were devoted to the examination, without eliciting any positive evidence of their being any central cause. Thus confirming the diagnosis of Dr. Hazlett, of its being of local origin. The case proved a very interesting one, more especially from the fact that several months ago, Dr. J. N. Ketchersid, of Hope, Kas., assisted by

Dr. Hazlett, and several others, removed about two inches of the posterior tibial nerve without any permanent relief. The paper and the case were discussed at length by Drs. McClintock, Ward, Ross, Lyman, Austin, Ketchersid, Blesh, Gunn, Felty and Curtis.

The Society now adjourned until 8 P.M. Promptly on time the President called the evening session to order, and Dr. G. A. Wall, of Topeka, read an instructive paper on

BLENNORRHITIS MARGINALIS,

which was discussed by Dr. Hazlett opening the discussion, Dr. Wall holding that errors of refraction were much less frequent an exciting cause than text books teach, to which Dr. Hazlett took exception, claiming that in his experience errors of refraction were the most frequent cause.

Dr. J. N. Ketchersid, of Hope, Kansas, read a paper on

MANAGEMENT OF ABORTION,

which brought out quite a flood of discussion, which was opened by Dr. Ward of Topeka, Drs. Lyman, Blesh, Felty, McClintock, Austin, Ross, Gunn, and others.

The subject for general discussion was now taken up, Acute and Chronic Dysentery, opened by Dr. Gunn, of Chapman, Kas. This brought out the experience of every member present, and ipecacuanha, sulphate of magnesia, nux vomica and opium were the chief drugs relied upon. The mode and manner of administration, together with special care of patient, differing somewhat. But cleanliness, rest, air and proper feeding were the chief anchors upon which they relied. By request, Dr. Ward, of Topeka, reported several cases of removal of the uterus and its appendages, successfully, for the relief of suffering incident upon diseased conditions of the same.

The Society adjourned to meet in Salina, Kan., in January. F. B. BROWN, Secretary.

NECROLOGY.

The death of Dr. Thomas A. Rodger, of the Montreal General Hospital, and Chief Medical Officer of the Grand Trunk Railway, is believed to have been the result of pyæmic infection consequent upon his hospital work. In May last, his trouble began as an erysipelatous attack, locating itself upon an apparently slight abrasion. A severe phlegmon of neck and face followed, which led up to a slow pyæmia with suppurating joints, and finally pneumonia. His death, despite the best efforts of the best talent of Montreal, took place after three months of suffering, a premature sacrifice while in the line of duty, at the age of forty-four. He had been president of the Medico-Chirurgical Society, Fellow of McGill University and member of Provincial Medical Board.

EDWARD WILD, M.D.—The death of General Edward Wild, M.D., a graduate of Harvard University and Jefferson Medical College, is reported by telegram to have occurred in South America. His was a remarkably eventful career, in which adventure was more prominent than medicine. When the Crimean war broke out he entered the Turkish army as a surgeon. And about four years after his return home, our own civil conflict occurring, Wild took a commission as Captain in the First Massachusetts, May, 1861. Twelve months later he was chosen Colonel of the 35th, and one year later still he was Brigadier-General, in which capacity he served through the war. Brookline, Mass., was his home, and his membership in the State Medical Society is registered as from that town, in 1850. He was latterly much interested in mining, and it was in part these interests that led him to Medelin, Columbia, where his death took place. He was 67 years old.

DR. JAMES HENRY BENNET, of London and Mentone, died at the latter place, aged seventy-five years. He was formerly physician to the Royal Free Hospital and Western General Dispensary. His "Practical Treatise on Inflammation of the Uterus and its Appendages," reached its fourth edition in 1861, and other publications of his on consumption, hygiene and the health resorts of the Mediterranean were among the most popular of their kind. He was himself a sufferer from pulmonary mischief, and beginning about 1859 spent his winters away from London, generally in the Rivas.

MISCELLANY.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from October 17, 1891, to October 23, 1891.

Major Peter J. A. Cleary, Surgeon U. S. A., upon being relieved from duty at Mount Vernon Bks., Ala., is ordered to duty at Ft. McPherson, Ga.
Major John C. G. Happersett, Surgeon U. S. A., upon being relieved from duty at Ft. McPherson, Ga., is ordered for duty at Ft. Custer, Mont.
Major Richard S. Vickery, Surgeon U. S. A., is relieved from duty at the Army and Navy General Hospital, Hot Springs, Ark., and ordered to duty at Ft. Monroe, Va. Major Curtis E. Munn, Surgeon U. S. A., upon being relieved from duty at Ft. Monroe, Va., is ordered to duty at Mt. Vernon Bks., Ala.
Capt. Edwin F. Gardner, Asst. Surgeon U. S. A., will proceed from Ft. Porter, N. Y., to New York City, for temporary duty as attending surgeon and examiner of recruits in that city.
Capt. Charles M. Gandy, Asst. Surgeon U. S. A., granted leave of absence for fifteen days, to take effect on final adjournment of Army Medical Board, now in session in New York City.
First Lieut. Benjamin Brooke, Asst. Surgeon, is relieved from duty at Ft. Riley, Kan., and ordered to duty at Ft. Leavenworth, Kan.
First Lieut. Frank R. Keefer, Asst. Surgeon U. S. A., upon being relieved from duty at Ft. Leavenworth, Kan., is ordered for duty at Ft. Riley, Kan.
Major Passmore Middleton, Surgeon U. S. A., will report in person to Col. Melville A. Cochran, Sixth Infantry, President of the Army Retiring Board at Newport Bks., Ky., for examination by the Board. By direction of the President.
Capt. Arthur W. Taylor, Asst. Surgeon U. S. A., will report in person to Col. John Mendenhall, Second Artillery, President of the Army Retiring Board at Ft. Adams, R. I., for examination by the Board. By direction of the President.
Capt. Daniel M. Appel, Asst. Surgeon U. S. A., is granted leave of absence for one month, to take effect about 6th prox.
Major William E. Waters, Surgeon U. S. A., upon being relieved from duty at Ft. Custer, Mont., is ordered for duty at Columbus Bks., O.
First Lieut. Nathan S. Jarvis, Asst. Surgeon U. S. A., is relieved from duty at Ft. Bayard, N. M., and ordered for duty at San Carlos, Ariz.
Capt. Richard W. Johnson, Asst. Surgeon, upon being relieved from duty at San Carlos, Ariz., is ordered for duty at Ft. Bayard, N. M.

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No. 19.

ORIGINAL ARTICLES.

CLINICAL NOTES ON LICHEN PLANUS.

Read in the Section of Dermatology and Syphilography, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY L. DUNCAN BULKLEY, A.M., M.D.,

OF NEW YORK, N. Y.

PROFESSOR OF DERMATOLOGY AND SYPHILIS, NEW YORK POST-GRADUATE MEDICAL SCHOOL, ETC.

Although lichen planus is one of the more rare diseases of the skin, it is one which occurs frequently enough to warrant the general practitioner being well acquainted with its natural history and therapeutics, while the very considerable suffering sometimes caused by the eruption, and its occasional rebelliousness to remedies, demand a further study from the specialist in regard to its nature and treatment. It is with a view of aiding in both these directions, that I have ventured to bring before this Association my experience which I have had with the disease during the past twenty years.

Erasmus Wilson¹ was the first to call attention to lichen planus, over twenty years ago, and his description of the eruption was so clear and graphic that it was at once recognized, especially in this country and England, and has long found place in most dermatological classifications; and repeated reports on its clinical features have established them so clearly that, in this country at least, it is now one of the best known eruptions of the skin in dermatological practice. As the description given by Mr. Wilson, in one of his earlier papers, is very lucid and complete, I may be excused for quoting it somewhat at length:² "Lichen planus is an eruption of pimples remarkable for their color, their figure, their structure, their habits of isolated and aggregated development, their habitat, their local and chronic character, and for the melasmic stains which they leave behind when they disappear.

The color of the pimples is of a dull crimson—more or less livid, and suffused with a purplish or lilac tinge. It is most characteristic in

the recently developed and discrete papules, and in the aggregated form is apt to assume the dusky hue of ordinary chronic affections of the skin. The striking color of the papules contrasts very strongly with the unaltered complexion of the skin on which they are developed. Indeed, it is generally the color and appearance of the pimples, without other symptom, that first attracts the attention of the patient to the disorder, and urges him to seek for relief.

"In figure the papules are flattened, smooth, and depressed on the summit, angular in outline, only slightly elevated, and of a size ranging between 1 and 3 lines in diameter. And this peculiarity of figure is so striking that we have selected it as the pathognomonic characteristic of the eruption. The redness may be the first sign to strike the eye, but redness is a phenomenon common to many eruptions of the skin; although, as we have just said, the redness of lichen planus is peculiar, whereas the flatness of the summit of the papules is altogether different from anything that is met with in other affections of the skin; and the flatness is rendered more conspicuous by the summit of the papule being occupied by a thin, horny, semi-transparent lamina of cuticle, depressed on the surface, and marked in the centre by the aperture of a follicle, which represents a sort of *hilum*. It is to this peculiarity of figure that the word *planus* is especially applicable, and this has guided our use of the term."

Lichen planus is rather an easy eruption to diagnose if these peculiarities are borne well in mind, for, as far as I have observed the disease, there are always primary lesions to be discovered somewhere, generally at the edge of the eruption, however old or altered it may be in character; and these primary lesions will always present the flat summit, with the depression in the centre.

In some instances, plaques of considerable size are formed by the aggregated papules of lichen planus, and especially on the lower legs these patches will, at first sight, be not at all suggestive of the eruption in question, but will resemble a dry, hard patch of eczema, of a purplish brown color, with adherent epidermal covering. But on closer inspection, the edges of

¹Wilson, Diseases of the Skin, sixth edition, London, 1867, p.

²Wilson, Journal of Cutaneous Medicine, Vol. iii, London, p. 117.

the patches are seen to be very sharply defined, and abruptly raised, quite differently from anything seen in the latter eruption, and every lesion will be found to have the flat summit characteristic of the disease. The form of the lesions has been likened to an inverted flower pot, only not proportionately so high, with the steep edges, and the hole in the centre, making the *delle* or depression seen in the papule of lichen planus.

The location of the eruption, or its seat of predilection, is also rather peculiar or characteristic. It is pretty constantly met with about the wrist, either on the flexor or extensor surface, and a few or many papules develop on the back of the hands. The next most frequent locality is on the lower legs, especially on the anterior aspect, and commonly it comes on the body only after there has been a considerable development on the extremities. In rare cases it attacks also the palms and soles, and still more rarely the face; it has also been observed by Wilson and others on the tongue, and in one of my cases which was very severe and general, the tongue and buccal cavity were badly affected, giving rise to great suffering. Some years ago,³ the present writer reported two cases of lichen planus where the eruption developed on the glans penis some weeks before appearing elsewhere, when it attacked the usual parts and presented characteristic appearances.

There is still another rather remarkable characteristic of the eruption of lichen planus, which is, that the papules or patches generally leave behind them a pigmentation much greater than would be ordinarily expected from such lesions; and this staining is measurably proportionate to the duration of the eruption or of the individual portions of it. In some instances the discoloration will be of a deep brown, and may persist weeks or months. In other instances it may be very light, and quite transient, but it is always a recognizable feature.

Much difference exists, in different cases, in regard to the subjective symptoms in lichen planus. In some cases, mild in character, there will be very little itching, and the eruption will give little inconvenience except from its appearance, while in certain cases the burning and itching attending the eruption are so severe that the sleep is greatly broken, and the suffering occasioned is excessive. Between these there may be all degrees of inconvenience, but in the main the disease is not characterized by much itching; the single papules appear from time to time, often unnoticed until seen.

Lichen planus, as before remarked, is one of the rarer diseases of the skin, and in statistics from a large number of cases, stands far down the list in regard to its relative frequency. In

my experience, among something over 10,000 cases of skin disease in my clinics at the New York Hospital, and the Skin and Cancer Hospital, there occurred forty-five cases of lichen planus, giving a percentage of .45. Among something over 7,000 skin cases in private practice, of which I have record, there have occurred forty-six cases of lichen planus, giving a percentage of a trifle over .65. The slightly larger relative proportion in private practice is probably accounted for largely by greater attention which would be paid to such an eruption among the wealthier classes, where the disfigurement would call for relief, even if the itching were not troublesome. The combined statistics from these two classes of patients give a total of ninety-one cases of lichen planus among some 17,000 cases, or over 53 per cent. The following table I shows the ages and sex of the cases:

TABLE I.—AGES OF PATIENTS WITH LICHEN PLANUS.

AGE.	Private Practice.		Public Practice.		Grand Totals.
	Males.	Females.	Males.	Females.	
3 years	...	...	1	...	1
15 to 20 years	...	...	1	...	1
20 to 25 years	1	2	5	3	11
25 to 30 years	4	...	1	2	7
30 to 35 years	1	1	1	3	6
35 to 40 years	5	3	2	3	13
40 to 45 years	3	3	1	5	12
45 to 50 years	4	5	5	1	15
50 to 55 years	3	5	4	5	17
55 to 60 years	2	2	...	1	5
60 to 65 years	...	...	...	...	...
66 years of age	1	1	...	1	3
	24	22	21	24	91

The eruption affects males and females in almost the same proportion, there being forty-five males to forty-six females. It will be further seen from this table, that the eruption is one of adult, or rather middle life, fifty-seven of the cases, or 62 per cent., coming between the ages of 35 and 55 years. There were but two patients under 20 years of age, both males, in public practice and few after 55 years of age. Curiously enough there were three patients with the eruption who were just 66 years of age. It is a little peculiar that all but two of the twenty-two females seen in private practice were married, and seven out of the ten females seen at the New York Hospital were also married. I have not the data in regard to the fourteen females at the Skin and Cancer Hospital, nor can I learn the marital relations of the male patients. I can hardly believe that this can have any influence in the disease, but it may be a clinical fact worth noting. The two unmarried females were aged 23 and 50 respectively.

Lichen planus has, as far as I know, no tendency whatever to spontaneous recovery. The following table II gives the duration of the disease, before coming under my observation, in forty-eight cases of lichen planus in private and

³ Bulkley, Archives of Dermatology, New York, Vol. vii, 1881, pp. 135, 392.

public practice. Many of the cases had been under other treatment; some had been entirely neglected.

TABLE II.—DURATION OF LICHEN PLANUS IN 48 CASES AT THE TIME OF APPLYING FOR TREATMENT.

DURATION.	Male.	Female.	Total.
Three months and under.	9	10	19
3 months to 6 months.	3	5	8
6 months to 1 year	7	3	10
1 year to 2 years.	1	2	3
2 years to 3 years. . . . .	. . .	1	1
3 years to 4 years.	1	. . .	1
4 years to 5 years. . . . .	. . .	. . .	. . .
5 years to 10 years.	1	2	3
10 years to 15 years. . . . .	. . .	. . .	. . .
15 years to 20 years.	1	. . .	1
Unknown.	1	1	2
Total	24	24	48

Here we see that while in a considerable number of them, the disease had lasted but a few months, there were some of the patients who had had the eruption a year or more, while in three instances it had remained between five and ten years.

Lichen planus is also rebellious to treatment, as is shown by table III, which exhibits the length of time during which forty-six patients with the eruption were under observation and treatment.

TABLE III.—DURATION OF OBSERVATION OF 46 PATIENTS WITH LICHEN PLANUS.

DURATION.	Male.	Female.	Total.
Three months and under	7	6	13
3 months to 6 months	7	3	10
6 months to 1 year . . . . .	. . .	3	3
1 year to 2 years	2	. . .	2
2 years to 3 years.	1	2	3
3 years to 4 years.	1	1	2
4 years to 5 years. . . . .	. . .	1	1
Seen once only.	5	7	12
Total	23	23	46

The *prognosis* of lichen planus, therefore, although good as to an ultimate cure, if proper treatment is faithfully carried out, should always be a guarded one in regard to the duration of the eruption, for under the very best of treatment the eruption may persist for weeks, or even months, and even under the best circumstances, seldom disappears very rapidly.

The *diagnosis* of ordinary cases of lichen planus should not be very difficult, if due regard be paid to the peculiar and almost pathognomonic features of the eruption which have been already mentioned; and, as before remarked, some of the primary lesions, quite characteristic in appearance, can usually be discovered in every case, if sufficient diligence be exercised.

The only eruptions which should ever be mistaken for lichen planus are, a newly developing psoriasis punctata, a papular eczema, a lichen simplex, scabies, a papular syphilide, and erythema papulatum.

Some time ago, Mr. Jonathan Hutchinson⁴ described this eruption under the name of lichen-psoriasis, and the mistake of confounding lichen planus with psoriasis is the more justifiable, because, as he has pointed out, the lesions of the latter, when they are just developing, present minute punctate spots, with a shiny summit, like those of lichen planus; and only this morning I saw a new case of the eruption under consideration, which had just been diagnosticated as psoriasis punctata by the family physician. As this case is one of very considerable interest, and as it makes the fifth case in which the eruption has developed largely on the glans penis, I may be excused for mentioning it somewhat in full.

Mr. H., aged 28, a strong, well developed and healthy man, with dark complexion and weighing 150 lbs., has never had any eruption before; nor, indeed, suffered from any illness. He never touches spirits or beer, but smokes ten to fifteen cigars daily. Three or four months ago, without any apparent cause, some papules developed on the right arm, on the anterior aspect, just below the bend of the elbow. The number increased every day, and one week later some similar papules appeared on the left forearm in the same situation; their number then increased in both localities up to about a month ago, the new ones coming both on the upper arms and down towards the wrists, and more lately a few small spots have appeared on the backs of the hands. About a month after the first appearance on the arms, similar points developed at the root of the neck, and soon formed several groups, extending along toward the shoulders. All of these papules have remained from the first, and at about the same size, seldom increasing to more than 2 or 3 millimetres in diameter, and not changing at all after they have become fully developed.

About a month after the first appearance of the eruption on the forearms, some points developed upon the glans penis, which increased in number and coalesced, forming patches 5 to 8 centimetres in diameter, of irregular shape, covering half the glans, and also many on the foreskin; these also have remained in much the same condition for the past month. There was little itching with the development of the eruption, but now he experiences considerable discomfort therefrom, especially at night, and particularly on the penis.

The cutaneous condition may be thus briefly described: On the anterior aspect of the upper arms, and the radial side of the forearms, there is an eruption, more pronounced about the bend of the elbow, composed entirely of flat, pinkish-red papules, many of them touching one another, but in no place making anything of a patch. The papules are of quite uniform size, but some of them a little irregular or star-shaped, and with a glazed summit, but nowhere surmounted by a

⁴ Hutchinson, Clinical Lectures on Rare Diseases of the Skin.

perfect scale. Some of them show marks of scratching, and have a more inflamed, red surface, covered with dried exudate. On the flexor surfaces of the left forearm are two very marked papules of large size, sharply defined, and more red than the others; these have been there almost from the first. On the backs of the hands there are a few scattered, red papules, similar in character to those seen elsewhere, most of which are dellated or slightly depressed in the centre.

On the glans penis the eruption, which covers half of its surface, is composed of slightly raised, purplish patches of various sizes and shapes, hard and slightly scaly on the surface, and giving a rather leathery sensation when handled. The prepuce, extending to nearly an inch when retracted, is about half covered with irregular papules and streaks, of a brownish purple, made up of similar papules, also somewhat scaly on the surface; as before stated, the eruption on the organ has remained about the same for a month. There is as yet no eruption on the legs, nor elsewhere than mentioned.

In a guttate psoriasis, which might affect almost the same extent of surface on the forearms, we would have the newly formed papules covered with a more silvery, easily detached scale; the color also would be more livid, and they would not be so decidedly flat and depressed in the centre. Moreover, in this particular case, the diagnosis from psoriasis could be made with certainty by the clinical history, for no psoriasis could remain, as this had, during three months in the same condition; for we know that the papules of psoriasis, which begin very small, invariably enlarge quite rapidly, and in this time would have presented, somewhere, typical lesions of the disease.

Lichen planus is sometimes rather difficult to differentiate from papular eczema and ordinary lichen simplex. But in both of these the papules are more acutely inflammatory, are always acuminate, and never flatten down so as to present the appearances described as characteristic of lichen planus; moreover, these eruptions are more violently itchy from the first, than is that under consideration.

The scattered papules of scabies, sometimes seen on the forearms and about the elbows and abdomen, may suggest lichen planus, but they resemble those of eczema more in character, and the diagnostic marks of scabies elsewhere should establish the diagnosis.

A newly developing papular syphilide sometimes resembles the eruption of lichen planus; but the eruption is more general from the first, while, as we have seen, lichen planus comes out slowly, it being commonly localized in one place for some time before appearing elsewhere. Moreover, the papules of the syphilitic eruption are never so flat and shiny as those of lichen planus, nor have they the central indentation, and the

scale which soon forms on their summit is very characteristic, being of a yellowish brown, attached in the centre, with the edges tending to become loosened. The general and other signs of syphilis will also commonly serve to prevent this mistake.

Erythema papulatum, coming as it very frequently does, about the extensor, and also flexor, surfaces of the wrists, does sometimes suggest lichen planus very strongly. But the papules of this eruption are much larger, as a rule, more elevated and rounded on the summit, and have not the peculiar purplish-pink lustre which can generally be found on the papules of lichen planus. Moreover, the lesions of erythema papulatum commonly come out very quickly, present much more inflammatory character, and subside much more quickly than do those of lichen planus.

For some years past there has been more or less discussion among dermatologists, in this country and abroad, respecting the relation between, or rather the identity of, the *lichen planus* as here described, and as we know it here and in England, and the lichen ruber, as it was so graphically described by the elder Hebra, in Vienna, twenty or more years ago. The subject is an important one, both as affecting prognosis and treatment, but it is also an intricate and difficult subject to discuss, and one which cannot, with profit, be entered upon on the present occasion. It was very thoroughly discussed, both from its clinical and histological aspects, by Dr. A. R. Robinson,⁵ of New York, some time ago, and as his views coincide wholly with my own, I cannot do better than to give you his brief but convincing conclusions, as follows:

"From a comparison of the symptoms, histology, prognosis, and treatment of the two forms of eruption, we find that as regards the symptoms: in lichen ruber the papules generally commence on the trunk, and tend to extend over the entire body, and in lichen planus they generally commence on the forearms and legs, and very rarely spread over a large area. In lichen ruber the papules are round, acuminate, covered with thin scales, and only show a depressed centre when situated around a hair follicle or undergoing a retrograde process; in lichen planus the papules are mostly angular in outline, generally umbilicated, and never scaly at the commencement. In lichen ruber the eruption is not symmetrical, and the papules do not increase by growth at the periphery; in lichen planus the eruption is generally symmetrical, and many of the papules increase in size to a certain extent by spreading peripherally. Lichen ruber, if not treated, tends to marasmus and death; lichen planus has no special effect upon the general condition of the system.

⁵ Robinson, *Lichen Ruber and Lichen Planus*. G. P. Putnam's Sons, New York. 1883.

"From microscopical observation we find that lichen ruber is an atypical keratosis, and lichen planus an inflammatory affection of the papillæ of the upper portion of the corium, with subsequent changes in the epidermis. In lichen ruber the corneous layer is hypertrophied, the rete also slightly thickened, whilst there are few or no changes in the cutis; in lichen planus the corneous layer is often absent, the rete is thickened, and there is a dense round-cell collection in the papillæ and upper part of the corium. Lichen ruber is, therefore, an anomaly of growth of the corneous layer, and lichen planus an inflammatory affection of the vascular portion of the skin." He also argues, very conclusively, that the two eruptions are also not two forms of the same disease, nor are they different stages of the same eruption, and I may say that, being more or less conversant with lichen planus in Vienna, and also with certain rare cases which have occasionally been met with in this country, I am myself most thoroughly of the opinion that lichen ruber and lichen planus are radically two entirely distinct diseases.

I had hoped to be able to give details of some very interesting and severe cases of this disease which have been under my care, but this paper has already exceeded the limits I had proposed to read, and will defer their presentation, but will make a few comments on the general features of the disease, as they have presented themselves, especially in private practice.

I have been constantly impressed with the observation of the far greater severity, and also obstinacy; of the eruption, in women than in men. On looking over my notes of the eruption in the latter, I find very few instances where the eruption was very general, and hardly any one where it caused what could be called any very great distress. But among the female cases I find a dozen cases in whom the eruption became very general, and in nine or ten of these, the suffering from the disease was very great indeed. In one of them the eruption had lasted two years before it came under my care, and another lady had suffered fifteen months. In several of these cases it was necessary to make use of internal quieting remedies in order to get any rest at night. I have also been struck by the fact that, in most of the cases in females, in private practice, certainly those who have had the eruption at all severely, the sufferers had been accustomed to the very great use or abuse of water on the skin, in the way of cold daily general ablutions, so that I have inquired into the fact, and seldom fail to find this to be the case. As this is a more common custom among females than males, in this country at least, I have been led to believe that it is an element of causation to be taken into account; and in a number of the cases occurring in males I have found the same habit to prevail.

Occasionally, even a quite severe eruption will disappear very shortly under but very moderate treatment, and in one instance a very general eruption, on a lady aged 52, vanished very shortly after her single visit, and apparently without the aid of treatment; but this is a great exception. In one instance an eruption in a gentleman, which had resisted pretty faithful treatment, disappeared under the employment of the cuticura remedies after he had ceased attendance; but, on the other hand, I find notes of other cases where these remedies had been tried in vain before coming under my care.

In regard to the *treatment*, inasmuch as we know very little as to the real causation of the disease, it is very difficult to give an intelligent explanation as to the lines to be pursued. The patients generally appear to be in good general health, and there is very little to take hold of in the way of rectification of supposed errors. We know, however, that the eruption is of a congestive and inflammatory nature, and it appears to be due to a suboxidation process closely akin to that found in eczema and other inflammatory diseases of the skin; and practically this line of treatment is that which is found to yield the best results—indeed, when faithfully carried out, this is commonly very satisfactory.

The alkalies, given with a free hand, will not only serve to mitigate the suffering of the patient, but arrest the further development of the eruption; and of these, acetate of potassa, with nux vomica and a bitter infusion, after meals, have served me about the best. Constipation must, of course, be carefully avoided.

An empiric sort of a prescription was suggested by the elder Bœck, of Norway, when in this country some years ago, and was strongly recommended by Taylor,⁶ in his clear and practical article on the disease some time since; and this has also done me most excellent service in many cases. It consists in the administration of from 10 to 20 grs. of chlorate of potassa, dissolved in considerable water, directly after each meal, followed in half an hour by 20 drops of dilute nitric acid, also well diluted. It was supposed to act as an oxidizing agent, promoting the assimilation of food, and the disintegration of effete substances.

After a cooling course with one of the above, a more tonic course is often required, and then nothing is better than the sulphate of iron, with sulphate of magnesia and sulphuric acid, in what is known in the dermatological world as Startin's mixture. Arsenic, in my hands, has been of very little use in this eruption; indeed, in the more acute stages, seems to aggravate the eruption.

In regard to diet, very little can be said, for we know so little of the causes underlying the eruption. But as it is an inflammatory affection, and associated more or less with a deficient oxi-

⁶ Taylor: Archives of Dermatology, Vol. I, No. 1, 1875.

dation process, the diet should be simple and nutritious, avoiding entirely stimulants and all food of difficult digestion, and also articles liable to undergo acid fermentation. Excess of sweets certainly has seemed to aggravate the eruption in my experience.

Locally, considerable can be done by properly directed measures, both in the way of relieving the general suffering and checking the disease.

In acute cases, the well-known calamine and zinc lotion, with an extra proportion of carbolic acid, certainly gives great relief, and seems to check the development of the eruption.

Ichthyol, in a 2 to 4 per cent. watery solution, kept freely applied, is also grateful and beneficial. When the skin becomes at all dry, a 1 or 2 per cent. carbolized vaseline, freely applied, is the best application.

In more chronic conditions, or when the eruption remains quite localized, the treatment suggested by Unna will sometimes seem to produce a remarkable result. This is a diachylon ointment containing even as high as 4 per cent. of carbolic acid, with bichloride of mercury added in slowly increasing quantity, beginning with 2 grs. to the ounce I have, in rare cases, seen the amount of the corrosive chloride increased gradually, until the patient bore well even 10 or 15 grs. to the ounce. This is of course a great exception, and this plan of treatment should be used with caution, although, when intelligently carried out, it certainly removes the chronic, obstinate lesions, more certainly than almost any other.

Alkaline baths are often of much service in this eruption, and may be taken two or three times weekly, followed by the calamine and zinc lotion, or the carbolized vaseline. On the other hand, as already mentioned, it has strongly impressed me, especially in regard to my cases in private practice, that too great bathing of the skin, especially cold bathing, has been often one of the chief features of causation of the eruption. I have also seen Turkish and Russian baths greatly aggravate the eruption. Sulphur vapor baths are certainly harmful, in my experience.

In conclusion I may say that, although lichen planus is a comparatively rare disease, still, like its first cousin, psoriasis, it is well worthy of careful study; for when recognized, and properly treated, it is curable, whereas, if neglected, it tends to remain and increase often to the very great distress and discouragement both of the physician and patient.

4 E. 37th Street, New York.

OLEO RESIN of male fern is best exhibited in combination with potassium bromide to secure the expulsion of the tape worm. The object is to reduce peristaltic action.

EARLY PSYCHICAL SYMPTOMS OF TRAUMATIC BRAIN INJURIES.¹

Read before the Section on Medical Jurisprudence and Neurology at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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OF HARTFORD, CONN.

The department of neurology in the practice of medicine has attained such proportions that it would be almost impossible in the limits of a single paper to give any complete history of the advances of even one year.

In this country there are six large journals devoted exclusively to this branch. Five quarterly and one monthly, viz: *The Journal of Insanity*; *The Alienist and Neurologist*; *The Journal of Psychology*; *The Journal of Mental and Nervous Diseases*; *The Journal of Inebriety*; and *The Review of Insanity and Nervous Diseases*.

Abroad, the periodical literature is more voluminous, and books and pamphlets follow each other rapidly. A neurological library of to-day to be complete, would number thousands of volumes and pamphlets.

This would be exclusive of the literature which appears in the general journals, comprising records of cases, theories, and discussions of disease of the brain and nervous system.

The different fields of neurology have been studied until the specialists find it almost impossible to master more than a single phase of the subject. The lunacy specialists, the specialists of nervous diseases, the specialists of alcohol and drug diseases, the specialists of idiocy and congenital diseases, the experimenter and teacher of psychology, and the electrician are all examples.

The unknown regions of the physiology and pathology of the brain and nervous system are attracting an increasing number of most ardent students, and already the discoveries are very numerous and startling, and the process of learning and unlearning is more and more difficult. In the department of *Medical Jurisprudence* progress and change is less rapid. Seven medical legal societies and one large quarterly present the many practical topics which are constantly appearing.

The confusion of theory and practice in both law and medicine, relating to questions of crime and responsibility, has given rise to many strange conceptions of the teachings of science. Thus from the text books and legal rulings of judges the lines of sanity and insanity are laid down as absolute facts. Free will, and accountability, judgment, punishment, equity, with brain control and capacity, are regarded as settled facts based altogether on theory. All these questions comprise a realm of the densest superstition and error that will continue until studied science

¹ Address by the Chairman of the Section.

cally. To-day the student of medical jurisprudence must pursue his studies above all present theories, text books and rulings of law. The questions of motive and human conduct must be decided from a knowledge of natural laws of physiological and psychological growth.

Science calls for a great revolution and evolution in the medico-legal solution of many of the disputed questions of to-day. The insane, the inebriate, the defectives of all grades and conditions, and the tramp and criminal, can never be restrained or prevented from being sources of peril to all law and order, on theory, or metaphysical abstractions of mind, or legal rulings. Medical jurisprudence of the future must depend on the progress of scientific medicine.

Both neurology and jurisprudence are largely influenced by the neurotic element of American civilization. This is a tremendous factor in degeneration and disease, and enters into all degrees of life and living.

The family physician and general practitioner are most favorably situated to become the earliest and most accurate students of most of those confusing problems in neurology and jurisprudence.

Every year it is more and more apparent that the failure to recognize the early symptoms of brain degeneration and disease, constantly increases the army of incurables. The crowded insane asylums, almshouses, jails and hospitals, refer back to early neglect, and failure to recognize and apply the means of prevention and cure.

A clearer knowledge of neurology would point out conditions and methods of treatment that could be successfully applied at that time only. An outline view of some of those early stages is the central topic of this paper.

There is probably no one disease more often mistaken in its early stages than general paralysis. Even after the symptoms have become apparent, there are confusing halts, and a delusive asking of symptoms that often puzzles even experts. A long formative stage precedes the well-defined symptoms, beginning in slight changes of conduct and character, elation of spirits, increased activity of the intellect; the disposition, the manner, the temper, the habits, the general character all become altered. Then come acts and words which are unusual, the friends and associates are conscious of some change which they seek to remedy by moral advice. Finally, when some reckless conduct or change of disposition is manifest, the physician is called and the disease is clearly made out. To the patient this has no foundation in fact, and sometimes the physician joins in this belief, and explains these changes of mind and conduct from a moral basis. Symptoms of alcoholic and drug excesses are explained in the same way. For a period extending over months and years

in many cases, the disease is above all question, and beyond all medical skill. This formative stage has been attended by distress, loss, sorrow and most serious blunders. In some cases, criminal acts and sad domestic and pecuniary afflictions have marked this period. If the family physician had made an early diagnosis, and the treatment been based on this, a different history and result would have followed.

Some of the ataxies have a similar obscure, early stage, marked by psychical disturbances which are regarded as moral lapses. Nearly all forms of insanity begin with this obscure failure of the high brain centers. Early changes of temper, conduct and character, defects of emotional control, defects of reason, slight and obscure at first, and yet clearly the oncoming shadows of diseases that should be anticipated and pointed out.

These changes and early symptoms are not new to science, but in most cases, they are overlooked and seldom receive the attention they deserve.

There is a class of symptoms that are already becoming the center of serious controversy. They are not only not recognized in the early stages, but are sharply disputed by both laymen and physicians. I refer to the alcoholic, opium and other drug symptoms, which are affirmed to be purely vicious acts and the voluntary giving way to the lower animal impulses. Public opinion has sought to control them by fine and imprisonment. The medical profession accepts this theory of treatment, only asserting after a time, the use of these drugs brings on diseased states. The impulse for alcohol and other narcotic drugs is always a symptom of some form of brain palsy. There are two classes of these cases in which this fact seems very clear. The first class are those with a history of some distinct traumatism—noticeably, sunstroke, blows on the head, profound wasting illness and severe injury of any kind.

Recovery follows, but with it appear changes of temper, character and emotions, then comes the drink impulse or the use of some form of opium. These drugs cover up other changes and are interpreted to be the cause of all subsequent degeneration and disease.

Many of these cases die of pneumonia or some other acute disease, others go on to insanity and become inmates of asylums, while the majority remain as common drunkards or inebriates slowly growing worse year after year. They are treated as low, voluntary inebriates, despised, persecuted and punished, and die the centers of wretchedness and misery, and frequently leave defective families that are always burdens to the world.

The *second class* of inebriates or drug takers have a distinct history of psychical traumatism. A man previously temperate and well, will have a history of profound mental shock, such as sud-

den overwhelming grief at the loss of wife, or children, or property, or the failure to realize some absorbing ambition, or some calamity that will distress him acutely. His entire character and disposition will change, and the drink impulse will appear suddenly, without any cause, and continue persistently.

Several instances have been noted in which the effect of a railroad accident, where no external injury was produced, was the beginning of the drink impulse. The shock of sudden fear seemed to so paralyze the brain as to demand alcohol or opium ever after. In these cases, alcohol may be taken at first as a medicine and in moderation, but the degeneration which calls for it is apparent when efforts are made to discontinue its use. Another class of cases show these symptoms equally marked; thus persons who occupy centers of great care and business or professional responsibility; persons who are most active in business in the prime of life, previously temperate, who suddenly begin to take spirits and rapidly become excessive drinkers, and defenders of its value as a medicine. Such cases are soon incapacitated and die. The drink symptom is always treated as a moral condition in these cases.

In the first class of physical traumatism some form of brain degeneration is apparent in this morbid impulse for alcohol and opium. The beginning and progress of the case confirms this.

In the second class of psychical traumatism, a brain palsy and sudden perversion of brain function and activity takes place, and the demand for alcohol and opium is the expression of this state.

In the third class, the use of spirits is a symptom of exhaustion and general brain failure.

All these forms of palsy and degeneration are rapidly intensified by the chemical action of the spirit or drug used.

The pathological condition which calls for relief by these drugs has a uniform order of events, beginning at a certain point and passing down, marked by a regular succession of symptoms, reaching a certain termination that rarely varies.

The drink craze is a symptom which should never be misinterpreted or overlooked. Any one who persists in using alcohol or opium to excess is suffering from some brain degeneration and disease, which requires medical study and care.

The use of alcohol or other drugs is, in a certain number of cases, a marked symptom of insanity. This fact has been noted for many years, and generally occurs in neurotics who, after some great strain or mental perturbation, become excessive users of spirits, and continuously or at intervals, stupify themselves with such drugs. When arrested and deprived of spirits in jails, acute mania or melancholy follows; then it appears that the spirit and drug craze were only

symptoms of insanity concealed and masked by the spirits.

The facts in this direction are numerous and startling, and unknown except to the few students who are at work in this field.

Scientific study has established this fact, viz. that the "drink craze" (meaning the impulsive unreasoning desire for spirits or narcotics) is a symptom of disease. Whether this is so in all cases at the beginning is not yet established; yet nothing can be more certain than this, that the use of spirits will cause disease and diseased conditions in all cases.

Another fact is becoming more prominent, that the number of inebriates of all forms is increasing; and with them the army of neurotics and defectives is likewise rapidly growing larger.

The problems of causation, prevention and cure are still involved in the realms of obscurity and quackery. Great parties and numerous societies are attempting its solution from the moral side alone.

As a scientific problem, it is practically unknown, and yet, no question of modern times so eminently one of causes and conditions that are tangible and within the range of science to understand.

The neurologist must point out the road and stimulate the family physician to study the early psychical symptoms, which, like signal flags of distress, are becoming more apparent.

Scientifically the abnormality of an increasing army of neurotics and suicidal drug takers, who receive no care or medical attention until they are chronic, is a reflection on modern medicine.

Over five million of laymen in this country are agitating the question of means and remedies to check this disease. Of the sixty thousand physicians, less than a hundred have given any special attention to the cure and prevention of this wide reaching malady.

The specialists can study these cases in asylums, but the family physician must be the scientific student to point out the early causes and remedies. The drink problem can never be solved except from physiological and psychological study. This must begin with heredity, growth, nutrition, culture, surroundings and all the phenomena of life.

The early psychical symptoms must be studied also, the traumatisms, the beginnings of pathological changes that manifest themselves in the drink impulse.

This is the path along which science must seek the solution of this problem. The temporary agitator and reformer must give way to the physician. The roar and conflict of parties and societies will die away, and only the voice of science will be heard. Then the armies of inebriates, criminals, and insane will be halted, disbanded and forced back to health and rational

ving. The inebriates will be protected and housed. The saloon will disappear, and alcohol will be unknown. This will be a reality when medical men take up this study from a purely scientific point of view.

In discussion Dr. Kiernan said:

He thought that Dr. Crothers did not fully appreciate the legal difficulties in caring for the inebriate. It is only when he has reached criminality that the law becomes efficient in restraining his morbid appetite. Additional difficulty is added to these cases by the confused rulings of courts regarding tests of criminal responsibility. There were, however, signs of advancement and a disposition to yield time honored but erroneous precedents. Inebriates should have the same legal status as lunatics.

THE NEUROSES FROM A DEMOGRAPHIC POINT OF VIEW.

Abstract of a Paper Read in the Section of Medical Jurisprudence and Neurology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY IRVING C. ROSSE, M.D.,
OF WASHINGTON, D. C.

The title of this paper may seem rather ambitious one, since the study of vital and social statistics, and their application to the comparative study of races and nations, is almost too new to furnish many principles that may serve as bases of induction. However, I purpose to state in a fragmentary way a few notes and observations bearing on the subject.

More than usual experience as a traveller has brought me in contact with various races of men under different mesological conditions. Experience and observation in this line show that, in spite of physical and moral varieties, there exists practically, for the physician, but one people, for there are no wide differences, biologically and medically speaking, in the human species; the infirmities of men, notwithstanding their physical inequalities and the extensive range of nosological table, are much the same the world over, no matter whether they be classified among the white, the yellow, or the black races. I confine myself advisedly to the simple classification of white, yellow and black, as it seems to be the best for descriptive anthropological purposes, and is, moreover, that adopted by Aristotle, Cuvier, and by a recent contemporary authority, Dr. Latham.

In the consideration of ethnological subjects it seems to be an inability, on the part of the people, to rid the mind of such abstractions of geographical lines and political distinctions, though it is well known that they will not keep any disease or noxious products. Indeed, the prejudice is carried so far that one might infer

the notion that being born in a stable makes one a horse. We should not lose sight of the fact that the offspring of an English man and woman in Africa will partake of the ethnological characteristics of the Anglo Saxon race for all time to come, so far as we know, and that the descendants of a black African man and woman in America will perpetuate the negro type with marked persistency. The latter fact is so well established that in studying cases of the crossing of the colored races, families have been observed in which, at the end of several generations, there were a series of children having much more than their father and mother the signs of an African mixture, going back at least to a fifth anterior generation. A woman whose father was a quadroon and whose mother showed traces of African blood, having married an Englishman of pure race, had nineteen children, all of whom showed unequivocal traces of this sixteenth of African blood (*Bulletin de la Soc. d'Anthropologie*, 1865, p. 288). Among the motley population of the West Indies, it is noticeable that the African negro, transplanted to a sky but a little different from his own, has scarcely undergone any physical or moral modification; in fact, he flourishes in the Antilles like the green bay tree, nature there being so much in his favor that after successive generations of mulattoes, the children revert to the negro type. Of course I do not pretend to deny the influence of meteorological conditions. Food and drink, and social and political surroundings; the conception of the remotest past and a forecast of the remotest future circumstances; everything in space, from a man's shirt to the farthest nebulae and deepest stratum of earth that he can infer, are but parts of the tremendous whole that acts upon man, or that he can act upon.

In the climate of the West Indies, for instance, which Darwin speaks of as a great wild, untidy, luxuriant hothouse, the combined effect of humidity with extreme heat softens, relaxes and impairs the fibres in men and animals, renders them lazy, inert, phlegmatic, and reduces them promptly to a state of complete atony. In these islands of indolence, even mosquitoes are lazy, and appear supremely indifferent when compared with the ones that I have seen inside the Arctic circle in Northern Alaska. Fish are not game. It is related with some show of authenticity, as evidence of climatic result, that the tarpon has allowed itself to be caught by fishermen who dived to the bottom and placed a hook in its mouth. Mice are also wanting in the alacrity that characterizes the northern species. Imported quadrupeds weaken and degenerate rapidly. The hog alone flourishes. Frenchmen do not acclimate and flourish in the Caribbean climate as they do, for instance, in Canada, under the same isotherm as Denmark, and Dr. Rochoux declares

that families who are not from time to time recruited become extinguished in the third and fourth generation.

It is true that atmospheric vicissitudes have much to do with the sicknesses of all latitudes, and may impart a different shade of color to a malady, that is produced by a sort of anatomical determinism. Meteorological influences of the climate modify the telluric conditions, alimentation, habits, etc., yet as regards climate, observation and experience seem to be our only guides. Up to the present time, climatology has given us many figures with but few results, and topography teaches nothing upon the salubrity of a country. It does not explain why cholera is in India, plague in Egypt, and yellow fever on the shores of the Gulf of Mexico. Nor does it tell why malarial fevers spare New Caledonia, in spite of the existence of numerous marshes, and why they ravage Madagascar in spite of its grand chain of mountains.

We, of course, do not look for sunstroke and malarial fevers among Eskimo, nor for frost bites and snow blindness among the natives of tropical Africa, yet I have found locomotor ataxia equally in Hayti and New York, and have seen the prevailing geophagism of the Antilles and South America among negroes of the Southern States.

This neurosis of the function of digestion is not the exclusive infirmity of degraded and primitive negro tribes. Pathological geophagy is found among the yellow races in Java, China and Siberia. It has been observed in the white race in some of the provinces of Spain, and among the poorer classes of whites inhabiting the pine barrens and thinly settled portions of several Southern States.

Gastric depravity is not confined to human beings. Collective investigation on this subject enables me to mention numerous instances.

I have known a sow to eat her whole litter of pigs, and I have seen coprophagy in one of the elephants confined in the London Zoological Garden. On observing the habits of the fur seal during four visits to the Prybolof Islands, I have learned that these animals are in the habit of swallowing stones. The lithoborous habits were confirmed by finding in many stomachs stones weighing $\frac{1}{2}$ lb. apiece. One paunch contained in the aggregate over 5 lbs. of large pebbles, and in the stomach of one sea lion there were found more than 10 lbs. of stones, some of them of great size.

If such facts as the foregoing convince the biologist of the identity of pathological phenomena occurring in the animal series with those observed in man, it is more striking from an anthropopathological point of view that there is stronger relation among diseases of men of all races, in all climates. Nervous diseases form no exception to this principle; for in a general way it is

true that all species suffer nearly in the same manner when exposed to the action of the same morbid causes.

In a retrospective way it is quite possible for a neurologist to study at the present time some of the convulsive manifestations of the Middle Ages; and if we have the snake worship, magical associations and nocturnal mysteries of voodooism in Africa and Hayti, is not our own country preëminently the land of spiritualists, mesmerism, soothsaying, and mystical congregations?

Much of my practice having been among Jews I have had occasion to notice the calm, sober and sedentary manners of that cosmopolitan race in whom the prolonged influence of climate has certainly caused no material transformation of type. The world over, they preserve the Semitic stamp, and observe the excellent hygienic code that secures them such pathological immunity, that it is said they are less often struck by lightning than other people. On the other hand, the phenomena of nervous and mental disease are more frequent in them than in other races.

We find familiar examples of strange nervous manifestations in such circumstances as a dance among the Sioux Indians, or a revival among the Anglo-Saxons at a camp-meeting. At both many of the participants will sing, laugh, weep, foam at the mouth, and fall exhausted in a faint or swoon.

Analogous conditions of nerve disturbance may be found equally among the black inhabitants of equatorial latitudes and the Hyperborean Mongoligæ who live under the midnight sun. Besides gross anatomical differences in the negro and a difference of personal essence, so to speak, we find an obtusion of peripheral sensibility, said to be owing to flattening of the tactile corpuscle. There is a want of fineness in the reflexes, lessened sensibility to alcohol, small intensity of nerve action, and, according to some observers, difference in the electrical state. I have noted similar things among the Eskimo of Berin Strait, the Tchutchkis of Arctic Siberia, and among the Innuits population generally. The nervous derangements of the Northern tribes, who, by the way, believe in and practice Shamanism, go to show that nervous diseases are not, as many people believe, confined to civilization. Among these people I have seen insomnia, epilepsy, chorea, cerebral hæmorrhage, paraplegia and hemiplegia, and suicidal mania.

A nervous affection known in the State of Maine as the jumping disease, has its analogue in the Siberian *emeryaki*, so prevalent in the vicinity of Jakutsk. I may remark incidentally that, in the original account of this affection given to the public, the word was incorrectly spelled. Dr. Bunge, of St. Petersburg, writes me that it should be written *emeryaki* in order

approximate its Russian pronunciation. There is, besides, *emeryak*, the male patient; *emeryaki*, *emyraka*, the female patient; and finally a verb, *emeryatschitz*, to be affected with this disease. My friend, Lieut. Schutze, of the Navy, who has seen much of this disease, thinks it is owing to excessive consumption of tea and tobacco, and psychic depression of isolated communities and long polar nights.

The ancient habit of tattooing is still common among school-boys, sailors, soldiers, criminals, and prostitutes living in so-called civilized communities. The practice, generally confined to a low grade of development and originating in perversion of the sexual instinct, is found pretty much over the world, notably in the Polynesian Islands and some parts of Japan, and I have been struck with the similarity of design on the chins of women when visiting two places so far apart as Morocco and Saint Lawrence Island. To anticipate criticism for mentioning what may seem a very trivial subject, I would say that tattooing is significant from a medico-legal point of view, no less a person than the Lord Chief Justice of England, having characterized it as a matter of vital importance.

As regards perversions of the sexual instinct and outrages on morals, our common humanity seems to have much the same aptitudes and instincts, regardless of the points of the compass.

Even a superficial observance of the sexual morals of the Eskimo causes one to smile at Lord Kame's "Frigidity of the North Americans," and at the fallacy of Herder, who says: "The blood of man near the pole circulates but slowly, the heart beats but languidly; consequently the married live chastely, the women almost requiring compulsion to take upon them the troubles of married life," etc. Nearly the same idea, expressed by Montesquieu and repeated by Byron in "Happy the Nations of the Moral North," are statements so at variance with my experience, that this fact must alone excuse a reference to the subject. So far are they from applying to the people in question that it is only necessary to mention, without going into details, that the women are freely offered to strangers by way of hospitality, showing a decided preference for white men, whom they think beget better offspring than their own men. In this regard one is soon convinced that salacious and prurient tastes are not the exclusive privilege of people living outside of the Arctic circle; and observation favors the belief in the existence of pederasty among Eskimo, if one may be allowed to judge from circumstances not necessary to particularize, and from a word in their language signifying the act.

Coming nearer to home, we find that paranoia and general paresis are more common in the white race as they come under the civilizing in-

fluences of town life, the bad features of which are increased consumption of tea, alcohol and tobacco, exposure to venereal disease, and the unequal distribution of wealth. The same causes seem to have produced an anatomical determinism in the black race, among whom suicide and insanity were rare before the civil war, which goes to show that such affections are modified by mesological causes rather than by race.

I trust that the foregoing experiences, incomplete as they are, may call the attention of others to the study of pathological anthropology in its bearing upon nervous diseases; and if any observation of mine shall prove genetic enough to broaden the enthusiasm of the medical man, and enable him to show less hesitancy in the treatment of disease, then I shall not regret having claimed your attention.

In discussion of Dr. Rosse's paper, Dr. Osler referred to the remarkable fact that chorea was rare in the Indian and negro, also that locomotor ataxia was rare in the colored race, while syphilis was common. On the contrary, hysteria was a frequent disease among negroes.

Dr. Hughes said that Dr. Beard had made the observation that nervous diseases were relatively less frequent in the South than in the North.

Dr. Kiernan recalled that Dr. Spitzka, Dr. Bannister and himself had made a study of ethnological psychiatry. Paretic dementia, for example, was present in the negroes of New York and Chicago, but absent from those in the South. The reason for this was found in that in the cities named they were exposed to the same conditions that produced the disease in the white race.

Dr. Rosse, in closing, said that he had recently seen a case of locomotor ataxia in a full-blooded negro.

STATUS EPILEPTICUS.

Read in the Section of Medical Jurisprudence and Neurology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY G. R. TROWBRIDGE, A. M., M.D., AND C. B. MAYBERRY, A.M., M.D.,

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It should be a source of regret that a prominent writer and authority in medicine, in the description of epilepsy, in his work on practical medicine, makes this statement: "As regards the immediate danger from the paroxysms, the prognosis is always favorable;"¹ and, moreover, he makes but bare mention of the condition status epilepticus, when in reality it is the most serious phase epilepsy assumes. It is for the very reason that but comparatively little consideration has been given to this condition by the

¹ Flint: Principles and Practice of Medicine.

profession, excepting the medical men connected with institutions for the insane, that it has been chosen the subject of a paper, with the hope that, without being obtrusive, a somewhat systematic description and a few suggestions in regard to the treatment of such cases may be given, which may be of some interest and value.

The alarming mortality among epileptics, shown by the reports of our asylums and hospitals for the insane, and due in a great measure to status epilepticus, makes constant demands for new suggestions and ideas in the treatment of these cases; and when, moreover, it is taken into consideration that every individual, whether in an insane asylum or not, who has fallen prey to the as yet unexplained disease, idiopathic epilepsy, either in a mild or severe form, may at any time be attacked with this almost surely fatal phase of the disease, it would seem that any point, either in clinical history, pathology or treatment, must be of interest to the profession, and certainly to the neurologist and alienist.

This paper has been prepared in the hope that it may possibly advance some new ideas, and at least be a reminder of this extremely serious phase of epilepsy.

As to the cause or causes productive of idiopathic epilepsy, we must, as yet, say we do not know, and consequently the same statement must be made in regard to status epilepticus; so the treatment of these cases will of necessity be dependent upon theory and symptoms.

Whether or not epilepsy is an entity and has but one cause in its production, or is a disease resulting from a number of factors, it is well known that it varies in intensity from a form which but slightly interrupts the daily routine of life to one which utterly destroys the individual physically, mentally, morally and socially, and no matter how mildly the neurosis may exhibit itself in a special case, the individual has the taint of lesion, which at any time may be productive of violent convulsions, and in a few hours carry its victim into eternity.

It is as if one were standing near a comparatively innocent and harmless stream; but the bursting of a dam sets in motion the pent-up flood, and in an instant he is swept into oblivion.

If we accept the theory of J. Hughlings Jackson regarding the cause of epilepsy, viz., an over-discharge of nerve force, or energy, from the brain cortex, we might define status epilepticus as a continuous, rapid and violent discharge of this nerve force, followed by a condition of extreme stupor verging upon coma, or, in place of the stupor, a period of maniacal excitement, though this latter is extremely rare.

Status epilepticus can scarcely be considered a special form of epilepsy, nor is it all correct to make it a distinct disease, but, on the contrary, it should be regarded as a climax of epilepsy.

A condition resembling status epilepticus may result in epileptics in whom the disease is caused by gross lesions, as tumors, cysts, etc., and to a considerable extent it is analogous to the epileptiform seizures, and consequent condition of parietic dementia; but it is not the purpose of this paper to treat of such cases.

In order to preserve as far as possible a systematic order in the consideration of the subject, the following headings are given:

1. The clinical history.
2. Resumé of cases treated.
3. Notes of autopsies.
4. Prognosis.
5. Treatment.

The clinical history of status epilepticus, "état de mal," or "les séries," of the French, or, as Charcot calls it, "the epileptic acme," from observations made by the writers upon the cases to be cited hereafter, is as follows:

A rapid succession of convulsions, usually of "grand mal" type, with intermissions varying from a few seconds to a few minutes, and often following one another so closely that they resemble one continuous convulsion, the patient being in a stuporous or even comatose condition in the intervals.

The pulse and breathing are greatly accelerated, the former being weak and irregular; there is deep congestion of the face and neck and intense throbbing of the carotids.

The temperature rises rapidly, until it has reached 104°-107° F., and there is often a difference in the temperature of the two sides, the greatest heat being on the side which is most convulsed.

As the convulsions increase in frequency and violence, there is a corresponding rise in the temperature and a deepening stupor or coma in the intervals. The conjunctivæ are insensitive; the pupils are widely and (as a rule) evenly dilated, though occasionally there is a difference in size, and are not affected by light; patient is bathed in a cold sweat, though the skin feels intensely hot; sordes appear on the gums and teeth, and the bladder and bowels are involuntarily evacuated. This condition may last from one to several hours; but, as a rule, the convulsive stage is of comparatively short duration, though occasionally it is prolonged.²

Death may occur in this stage from exhaustion, or the convulsions may cease and the patient pass into the second or stuporous stage.

This stage is characterized by an intense stupor, total abolition of sensation and motion, exceedingly depressed heart's action, and a consequent dyspnoic condition. The temperature re-

² One patient in the West Riding Asylum had 1,849 convulsions, covering a period of fifteen days. Delasuiave reports a case where the first stage lasted a month, the patient having 2,500 fits. A patient in the Northern Michigan Asylum had 3,000 in three weeks.

mains above normal, though not as high as in the convulsive stage.

There is paralysis of the muscles of deglutition, very often irritability of the stomach, and sometimes profuse diarrhœa; bed sores appear; the tongue is dry and coated; increasing sordes on the teeth and gums, and, in short, everything points to a rapid dissolution. The second stage lasts from one to several days.

Charcot³ makes two classes of status epilepticus, viz., "the minor acme ('les petites séries'), constituted by from two to six fits, and the major acme ('les grandes séries'), in which from twenty to thirty fits have been reckoned in the twenty-four hours." It would hardly seem that this division is necessary, for the very reason that it is an extremely rare occurrence for from two to six fits to produce the stuporous stage of the status proper. Evidently Charcot regards the convulsive stage as constituting status epilepticus without including the comatose stage. Hence his two classes.

Rosenthal⁴ gives the following description: "Another severe form of epilepsy is described under the name of status epilepticus. It presents the following characteristics: Rapid succession of attacks, presenting slight remissions and without return to consciousness (convulsive stage); comatose condition secondary to these attacks, with abolition of reflex power, except during short periods of temporary increase (meningeal stage); more or less complete and permanent hemiplegia; acceleration of the pulse and respiration; and especially a marked elevation in temperature (40° – 43° C.), which persists even in the intervals of the paroxysms, and may increase after their disappearance. The duration of these attacks may vary from three to nine days; more than one half the cases terminate in death."

Putzel⁵ gives the clinical history in the following words: "The prodromata do not differ in any respect from those which are usually expected by the patient prior to the ordinary attack of convulsions; but the fits, instead of ceasing, follow one another rapidly, and before the epileptic coma has entirely disappeared, another convulsion makes its appearance. The intervals between the fits become shorter and shorter, until they run into one another and finally the patient appears to be in one long continued convulsion."

The pulse is regular, but usually small, the respirations become frequent and labored. The temperature begins to rise from the very beginning, and may rapidly reach a height of 104° , or 107° F., and upward. The skin is hot and scorching, the face is covered with an abundant, viscid sweat. Marked nystagmus is present,

and the face and neck may be drawn to one side. The pupils are dilated, either equally or unequally, and do not react normally to light.

"After the convulsions have lasted some time, hemiplegia develops in a large number of cases, the face and limbs being affected as in ordinary hemiplegia. . . . The sensorial and intellectual functions are totally abolished, and the patient lies in a profound stupor, which often deepens into coma."

Secondary or Meningitic Stage.—"At the close of the first stage the convulsions become more infrequent, and finally cease, but another series of symptoms develop. The intelligence is more or less affected, and the patient is in a condition of hebetude or coma." The author goes on to say that in this stage the coma may be replaced by maniacal excitement, general disturbance of nutrition, emaciation, bed-sores, and a gradual dissolution or an extremely slow recovery.

Bevan Lewis⁶ describes it as follows: "If the attacks succeed each other rapidly and consciousness is not restored between the convulsive seizures, if fit succeed fit at intervals of a few moments only, the patient remaining comatose, we have developed what is termed the status epilepticus, a condition of most serious import."

"The pulse and breathing become quickened; . . . the temperature rises to 105° or 107° F., with deepening coma or stupor. . . . As the fatal termination approaches, the convulsions become more frequent, a few seconds only intervening between each discharge, so at times they appear almost continuous, a fresh discharge being only recognized as a slight increase in the intensity of the convulsions."

"When this period arrives, however, the epileptic discharge becomes progressively feeble, and the fit may be characterized by a slight turning of the head and eyes to one side, with slight clonic movements of the limbs or merely convulsive twitchings of the mouth, with conjugate deviation. The conjunctivæ are, of course, quite insensitive, the pupils being widely dilated and fixed to the strongest glare of light, while the face and body are bedewed with a cold sweat. Often the temperature exhibits unilateral deviations, being highest by a degree or more on the side first (or most) convulsed. If the patient recovers, the fall of temperature is most rapid on this side until a balance is established, and subsequently an equal and continuous decline of temperature proceeds on both sides. . . . The mortality from status epilepticus is said to be due to (a) collapse and (b) to meningitis."

Bourneville⁷ in his treatise characterizes status epilepticus: 1. By the frequent repetitions of the convulsions, which may even become almost

Charcot: Diseases of the Nervous System.
Rosenthal: Diseases of the Nervous System.
Putzel: Functional Nervous Diseases.

⁶ Bevan Lewis: Text Book of Mental Diseases.
⁷ Bourneville: Études Cliniques et Thermométriques sur les Maladies du Système Nerveux, 1873.

continuous with one another; 2, by a variable degree of collapse, which may deepen into a most profound coma, unattended by any return to consciousness; 3, by a more or less complete hemiplegia, developing after a variable duration of the symptoms; 4 by increase in frequency of pulse and respiration; 5, by considerable elevation of temperature, which persists in the brief interval between the convulsions. He, with others, divides it into two periods—a convulsive and meningitic.

Calmeil, Trousseau, Delasuiave, Gowers, Webber and Blandford give more or less on the subject; but as their statements are covered by the authors already quoted, it is useless to give them here.

Twenty cases of status epilepticus have come under the observation of the writers; but only twelve are cited, as the remaining eight would only be repetitions of the others.

Case 1.—Male, aged 25; congenital imbecile; family history shows marked neurotic taint; had scarlet fever when 15 years of age, and soon after recovery epilepsy appeared; has had an average of ten fits a month since development of the neurosis; physical condition much impaired. During November, 1888, had three fits; December, eleven, and January, twenty-four.

All of this time he was taking a mixed tonic and bromide treatment. On February 24, at 2 P.M., after an interval of several days without fits, he had a severe convulsion, followed by others in rapid succession, averaging one every two minutes for the first hour. At three o'clock his temperature was 102° F., respiration 30, pulse 106, skin hot and covered with perspiration, pupils dilated equally and not reacting to light, face much congested; unconscious, though not having a convulsion at that time. Ether was given and carried to surgical anæsthesia, with a cessation of the convulsions. Given chloral hydrate, grs. xxx, by rectum. Slept well until 9 P.M., but on awakening he immediately went into a series of convulsions, having thirteen in twenty minutes. At 9:30 P.M., temperature was 104° F., respiration 35, pulse 130. Ether was again administered, and morphine sulph., grain $\frac{1}{4}$, hypodermically. February 25: Slept well during the night. This morning he lies in a stupid condition; temperature 105.6° F.; respiration 41, pulse 129, cold sweat over entire body, pupils dilated and insensible to light. Given nourishment and stimulants by stomach-tube. Remained in this condition until death, at 5 P.M. Duration of attack, fifty-seven hours; number of convulsions, forty-three.

Case 2.—Male, aged 28; congenital imbecile; had scarlet fever when ten years old, and immediately after developed epilepsy; no known heredity. During February, March and April, 1889, he had one fit while under tonic treatment. On May 2, between 1 and 5 A.M., he had one hundred

and six convulsions; at 5 A.M., temperature was 104.5° F., respiration 32, pulse 130. The fits followed each other with very short intervals, the patient being unconscious. Chloroform was administered, and continued for a half hour; ol. tig. gtts. iii, followed by profuse evacuations. In this case the convulsions were general, but stronger on the right side; right hemiplegia followed the attack. Patient sank into a stupid condition which lasted five days. During this time the temperature and pulse were constantly above normal, the gradual return to consciousness being preceded by an even fall of temperature. Sordes collected on the teeth; tongue brown and dry. The reflex action of the eye was lost, and death seemed imminent. Stimulants and nourishment were given constantly by the nasal tube. On the fifth day he recovered consciousness; the temperature slowly fell to normal. Rapid improvement followed, and in ten days he was able to be about the ward. Total duration of the convulsive and comatose periods was about ten days; number of convulsions, one hundred and six.

Case 3.—Same patient as Case 2. On October 27, 1889, was found in the morning in a comatose condition, which, without doubt, resulted from his having passed through the convulsive stage of status epilepticus during the night. Temperature 105° F.; impossible to arouse him from the deep coma; pulse weak and intermittent. Stimulants and nourishment given by nasal tube. The physical exhaustion was so great that the man sank rapidly, and died eight hours after first being seen.

Case 4.—Male, aged 30; neurotic family; epileptic from childhood; no specific history; good physical condition. Has had several attacks of status epilepticus, of which no record has been kept. These attacks were all marked by the large number of convulsions, their severity, the rapidity of their occurrence, and short intervals between them. On February 1, at 3 P.M., the convulsions began while the patient was outdoors. When first seen he had fifteen convulsions within a half hour and was in an extremely exhausted condition. Temperature 102° F., pulse small, body covered with cold perspiration. The convulsions were general and of uniform severity on the two sides. Conina hydrobrom., gr. $\frac{1}{100}$ was given hypodermically. One convulsion followed the injection after which the patient sank into a quiet sleep lasting six hours. On awakening his condition seemed much improved; temperature 99.8° , pulse 106; conina, grs. $\frac{1}{100}$, with digitalin, $\frac{1}{100}$, given hypodermically. Slept during the night without convulsions. Next morning he was much better, though very weak. Stimulants and nourishment. Two days after was about the ward as well as before the attack.

Case 5.—Same patient as Case 4. On April 15 had twenty convulsions, followed by great exhaustion. Given ether to anæsthesia, chloral, grs. xxx, by rectum. At intervals for twenty-four hours he had convulsions of a more or less severe character, followed by stupor, from which he could not be aroused. Stimulants, nourishments, injections of ether, digitalin and atropiæ sulph. were given without effect. Patient gradually failed and died ten days after. The highest temperature in this case was 105.2 F., which occurred just before death. For some weeks before each of these attacks the patient had been taking bromide treatment.⁸

Case 6.—Male, aged 45; no known heredity; cause of epilepsy unknown; bodily in good health; weight 170 pounds; has very few epileptic convulsions, usually not more than six in a year; during the four months before the attack had three convulsions; several previous attacks of status epilepticus. This attack began May 4, 1889, at 7 A.M., and in one hour he had thirty-two convulsions, which were continuous, the intervals between the fits being marked only by a slight diminution in the severity of the convulsions. At 8 A.M., there were no signs of exhaustion; temperature 100° F., pulse 90. Given ether to anæsthesia and morph. sulph. gr. $\frac{1}{3}$, hypodermically. No diminution in convulsions except while under ether. At 9:30, chloral, grs. xxx, by rectum, after bowels had been moved by enema. At 11 ether was given and carried to surgical anæsthesia, without effect. At 12 coninæ hydrob., gr. $\frac{1}{100}$, hypodermically; a few minutes after he had a single fit, and this was followed by sleep. This same dose was repeated at 6 and 9 P.M. Slept all night. No convulsions in the morning, no excitement. An interesting feature of this attack is the absence of excitement, which has always before followed status epilepticus in this patient.

Case 7.—Admitted July 8, 1889. Male, aged 35; family history of insanity and epilepsy. On January 4, 1890, was attacked with status epilepticus, though since admission has only had five convulsions; fits followed each other so closely that attendants were unable to count them. When first seen, the convulsive stage had nearly passed. Ether was administered, and morphine hypodermically. The convulsions were stopped entirely, but the man died in the second stage of exhaustion forty-eight hours after the commencement of the attack.

Case 8.—Male, aged 26; no known heredity; deaf-mute; febrile disease in early childhood the supposed cause of epilepsy; has had an average of five epileptic fits a month while under mixed tonic and bromide treatment; physical

condition is usually good, but at present somewhat impaired from constant use of bromides. May 25 had a series of convulsions in the night, number unknown, but when first seen he was passing from one fit to another without any marked interval. Given hyoscine hydrobrom., gr. $\frac{1}{100}$, hypodermically, at 4 A.M. Slept until 7 A.M., and was then awakened by a convulsion, which was immediately followed by others; given amyl nitrite by inhalation, without effect; ether administered, and chloral, grs. xxx, per rectum, with but a temporary cessation of convulsions; 12 M., coninæ hydrobrom., grs. $\frac{1}{100}$, hypodermically, after which the fits ceased and sleep ensued. At this time his physical condition was bad; temperature 104° F., pulse 142, body covered with cold perspiration, face cyanotic, hands and feet cold. At 9 P.M. he was somewhat restless, although there had been no recurrence of the convulsions; slight muscular movements in different parts of the body. Given nourishment and whisky per nasal tube, an enema, digitalin and coninæ hydrobrom., $\bar{a}\bar{a}$, gr. $\frac{1}{100}$, and atropiæ sulph., gr. $\frac{1}{80}$, hypodermically. Slept during the night without a convulsion, and is less stupid this morning; takes nourishment and stimulants. From this time he improved gradually, and in five days was about the ward again.

Case 9.—Same patient as Case 8. For past two months has had no convulsions under a mixed tonic and bromide treatment. August 20, at 2:30 P.M., an attack began similar to the last; physical condition much better than at time of last attack. When first seen had had thirteen convulsions; temperature 100° F., pulse 110. Given coninæ hydrobrom., gr. $\frac{1}{100}$; slept until evening without convulsions and was in good physical condition; takes nourishment this morning, and was able to be about the ward on the following day.

Case 10.—Male, aged 46; family history shows a predisposition to nervous disease; duration of epilepsy unknown; has a history of syphilis twenty years ago, but there is no indication of cerebral disease or that his convulsions are not true epilepsy. At the time of his attack he had had no convulsions for several months. On December 16, 1890, had three fits in the afternoon, followed by seven in the evening without physical failure. At 9 P.M. given coninæ hydrobrom., gr. $\frac{1}{100}$; slept during the night without recurrence of the fits. At 8 A.M. convulsions again occurred the same in character as before. Given chloral, grs. xxx, and potass. bromide, grs. 60, by stomach, without effect, also morph. sulph., gr. $\frac{1}{3}$, and atropiæ sulph., gr. $\frac{1}{80}$, with the same negative effect; at 11 P.M., coninæ hydrobrom., gr. $\frac{1}{50}$, with an immediate cessation of the convulsions. Patient rapidly improved, and in two days was in his usual health.

Case 11.—Male, aged 45; family and previous

⁸Bromide of ammonia, bromide of sodium, $\bar{a}\bar{a}$ gr. xv., suspended in a tonic mixture, t. i. d., and a pill of oxide of zinc, extract of opium, $\bar{a}\bar{a}$, gr. $\frac{3}{4}$, at night.

history unknown; has had previous attacks of status epilepticus, all having two points in common, viz.: 1. The large number of fits and their rapid occurrence, and 2, a state of secondary consciousness following such attacks in which the patient was greatly excited and very brutal; violent to any one who came near him. Physical condition good; has had three fits in the last three months. On May 10, at 4 P.M., he had a severe convulsion, followed by others with intervals of about two minutes between them. At 4:20 he was etherized, after taking chloral hyd., grs. xxx, and potass. bromide, 3 i. On coming out of the anæsthetic, no convulsions occurred until 5:30 P.M. At 6 he was given coninæ hydrobrom., gr. $\frac{1}{100}$. Slept during the night without convulsions. No attack followed this, and the man rapidly returned to his usual condition. The highest temperature during this attack was 104° F., pulse 110.

Case 12.—Same patient as Case 11. Physical condition impaired; no convulsions for several weeks. September 30: had twenty-three fits between 11 A.M. and 12:30 P.M. Given coninæ hydrobrom., gr. $\frac{1}{100}$. Convulsions ceased. Slept until 7 P.M., when the convulsions again commenced; coninæ repeated with same good result. October 1, had several severe convulsions, followed by unconsciousness, stertorous breathing and right-sided hemiplegia. After being in this condition for about fifteen hours, death occurred. Temperature in this case ranged between 103° on the first day of the attack and 107° at time of death.

Such are the histories of twelve attacks of status epilepticus.

Of the twenty cases which have come under our care, four were examined post-mortem.

These examinations showed certain points common to all: 1. A lack of symmetry in the two hemispheres, which is so often found in epileptics; 2, an inequality in the weight of the two hemispheres, also quite common in epileptics; 3, more or less extensive decortication; 4, intense engorgement of the brain and its membranes—the sinuses were filled with blood, the vessels of both the dura and pia were distended, the brain on section showed the puncta vasculosa to a marked degree; 5, in all four cases, and especially marked in two, serous effusion into the ventricles and arachnoid space.

In one of the cases there was softening of the first and second temporo-sphenoidal convolutions on the right side. In another, which showed all the symptoms of apoplexy toward the end of the attack, a large hæmorrhage from the middle cerebral artery on the left side was found.

In a third case, in which death occurred instantly and during a convulsion, a small hæmorrhage was found in the medulla.

In none of these four cases was the cause of

the status epilepticus found, and in only two was there evidence of the immediate cause of death. The others, in all probability, died from the exhaustion consequent upon the convulsions.

The prognosis of status epilepticus is very unfavorable, the mortality being estimated at fifty per cent. The violence and frequency of the convulsions; the high temperature; the rapid weak and irregular pulse; the consequent comatose condition, with its accompanying extreme depression, are all factors of such grave import that the outlook in most cases is very serious. Besides this, we must take into consideration the mechanical action brought into play, viz., the intense and powerful contractions of the muscles during a convulsion, which by exerting an irresistible pressure on the vessels, force the blood into the cerebral vessels, thus producing the great engorgement, with imminent liability to cerebral hæmorrhage.

Even though the individual passes safely through the status, hemiplegia often results, leaving him in a weak and helpless condition and totally unable to withstand a second attack.

The three most probable modes of death are: 1, exhaustion; 2, from cerebral hæmorrhage; 3, from serous effusion.

Treatment.—In a condition like status epilepticus, where the life of the individual may be destroyed in a few hours, any measure which would abort the attack is of the greatest importance. Our treatment must be chiefly symptomatic, at least until more is known of the pathological condition than we know at present. There are two important indications for treatment which must be met in each case: 1. To bring the convulsive period to an end as quickly as possible; and 2, to sustain the life of the individual through the stupid or excited period which may follow the attack.

1. In order to meet the first indication for treatment, a large number of drugs have been tried, with a view of depressing the motor centres of the cerebrum or cord, or of paralyzing the efferent nerves, or all of these, and thus preventing a fatal termination, either by diminishing the number of convulsions, making them less severe, or preventing them altogether. Among the therapeutic measures suggested to fulfill this indication, we shall consider only those with which we have had personal experience in our own cases. These include the following: Ether, chloroform, chloral hydrate, bromide of potassium, nitrite of amyl, sulphate of morphine, sulphate of atropine, hydrobromate of hyoscine, salicylate of physostigmine, and hydrobromate of conine.

Ether and chloroform are given with the purpose of immediately stopping the convulsion, the paralysis of the motor centres of the cerebrum and complete muscular relaxation,

However successful these may be in the convulsions of Jacksonian epilepsy, in our experience in cases of idiopathic status epilepticus they are but temporary measures, the convulsions ceasing only when the point of surgical anæsthesia has been reached, and coming on again before the patient has regained consciousness. They are of great use, however, in preventing the convulsions when exhaustion is imminent, while waiting for some other agent to act. Either may be used; but in a case where the heart and respiration are already in a weakened condition, the latter would be the safer.

Chloral hydrate by the rectum has succeeded in some cases, but has more often failed. In giving this drug, it has been the custom to keep the patient under an anæsthetic during its absorption, giving grs. xxx, and repeating it in an hour if necessary. Although acting as a depressant of the spinal cord and brain, yet the amounts which can be given with safety are usually too small to produce the desired effect. We have not used it hypodermically, but it seems probable that used in this manner the results would be much better.

Bromide of potassium has been given in several cases in combination with chloral hydrate, without any good results. If, as in several of our cases, status epilepticus follows a course of bromide treatment, very little could be expected from it, and indeed in any case, its action is so slow that but little could be hoped for from its use. In the few cases in which we have tried it has been given in doses of 3i-3ii.

Nitrite of amyl is highly recommended by the authors; but repeated trials have failed to establish its value. It has been given by inhalation, $\text{m} \times$, repeated at intervals. Although undoubtedly useful in preventing an impending convulsion of ordinary epilepsy, it has proved of little value in the cases of status epilepticus in this hospital.

Sulphate of morphine has succeeded in one case in which gr. $\frac{1}{3}$ was given hypodermically during anæsthesia; but in several other cases in which it was used it failed to change the course of the attack in any appreciable way, although given in doses of gr. $\frac{1}{4}$ - $\frac{1}{2}$, hypodermically.

Sulphate of atropine, in any safe dose, acts chiefly upon the cardiac and respiratory centres and upon the pneumogastric nerve, but very little upon the motor nerves of voluntary muscles.

Carried further than this, it stimulates the cardiac sympathetic and paralyzes the pneumogastric, and in consequence there results a heart failure. For this reason it is impossible to stop the convulsions without cardiac failure. Its immediate effect has been good by its stimulating action on the vagus and the resulting improvement in the character of the respiration and circulation. Although it has been

used with a view to stopping the convulsions, it is of more value in the second stage of neurosis.

Hydrobromate of hyoscine, if given in sufficient amount hypodermically, produces almost immediate sleep, affects the motor tract of the spinal cord and cerebral cortex, and in a case in which its use is not contraindicated by weakness of the heart or respiration, its employment promises good results. In the cases in which it has been used, the convulsions have quickly ceased, the heart's action has been slightly depressed after a short time, the respirations have been more frequent and less full, and sleep has followed, lasting from two to eight hours, with a recurrence of the convulsions on awakening, and an improvement has occurred in the patient's condition. Although hyoscine has failed to bring the attack to an end in any of these cases, yet the rest and freedom from convulsions for several hours, with the resulting improvement in the bodily condition, would indicate its use as a temporary measure. It has been given in doses of gr. $\frac{1}{80}$ - $\frac{1}{100}$, hypodermically, its success in acute mania when given by this method, and its almost complete failure when given by the stomach, suggesting a similar result in status epilepticus.

Salicylate of physostigmine, gr. $\frac{1}{60}$, was given in one case with a view of depressing the cord sufficiently to stop the convulsions, but without success.

Hydrobromate of conine was first used in a case in which most of the other measures in this list had failed, and its use was followed by an almost immediate cessation of the convulsions. Its action is from the periphery, extending toward the centre, the motor nerves being chiefly affected, the sensory nerves remaining almost unchanged. When a case in which it has been given is carefully watched, the following results are noticed: 1. Weakening of the convulsive movements, beginning at the lower extremities, and extending upward over the trunk and upper extremities, and last the head and face, with finally a complete cessation of the movements if a sufficient amount has been given; 2, slight dilation of the pupils and ptosis; 3, some impairment of general sensibility; 4, heart slow and full, respiration slow and labored; 5, combined with sulphate of morphia, sleep follows, lasting several hours; 6, if the convulsions are to return, as the influence of the drug is lost, fibrillary contractions, beginning above and passing downward—that is, in the opposite direction from what they ceased—and finally the general convulsions are reestablished. This drug has been given in small doses, gr. $\frac{1}{100}$ - $\frac{1}{40}$, hypodermically, and repeated as often as indicated, the administration being guided by the character of the respiration. It has usually been combined with sulphate of morphine to produce sleep, and sulphate of atropine to act as a stimulant to the

respiratory and circulatory organs, and also at times with digitalin and hyoscine. Only two of the cases in which it has been used have terminated unfavorably. In the first it stopped the convulsions; but they recurred, and cerebral hæmorrhage complicated the case. In the second case it was given, as were all the drugs mentioned, the only measures attended with any success being the administration of ether and chloroform, until there was complete muscular relaxation; and in this case the patient died suddenly, while in a fit, from hæmorrhage into the medulla. In several of the cases, conine and a small amount of morphine have been the only drugs used. Although it failed to control the convulsions in one case, yet it has been the most successful method of treatment tried, and its results encourage us to believe that it will succeed in the majority of cases of status epilepticus.

2. The exhaustion of the patient gives the second indication for treatment. In almost every case of status epilepticus, before the convulsions can be controlled there are evidences of physical failure; the pulse is rapid and weak, the respiration shallow and increased in rapidity, the temperature raised several degrees above normal, and a profuse perspiration covers the body, all of which call for immediate treatment in order to carry the patient through the dangerous period. The condition of the patient usually prevents the administration of food or medicine by the mouth, although if introduced into the stomach they will be retained. To fulfill this indication, we have introduced two methods: 1. The hypodermic use of such agents as atropine, digitalin, spt. frumenti and quinine sulph.; and 2, the introduction of milk, eggs and stimulants into the stomach by means of the nasal and stomach tubes, on account of the inability to swallow; artificial introduction of food into the stomach being especially called for in cases in which the stupid or excited periods are of several days' duration.

The conclusions drawn from this paper are as follows:

1. On account of its association with epilepsy, status epilepticus should not be considered a distinct disease, but merely a climax of the neurosis.

2. It consists of two stages: 1. A convulsive, and 2, a comatose, though the latter is sometimes replaced by a period of maniacal excitement.

3. That there is no demonstrable lesion causative of the status.

4. That the prognosis is unfavorable.

5. That the treatment is in a measure symptomatic, but considerable reliance can be placed upon the hypodermic use of the hydrobromates of hyoscine or conine combined with the sulphate of morphine.

FUNCTIONAL BRAIN DEGENERACY.

Read in the Section on Medical Jurisprudence and Neurology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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It is interesting to notice how much we are given to the habit of grading and estimating others in society. We are continually engaged in this kind of work, and we consider the opinions we have of our acquaintances and associates as very valuable items of information. So intuitive and instinctive is this kind of work that we do it unconsciously, as it were; and as soon as we make an acquaintance, we find ourselves silently estimating and classifying him.

The two particulars in which we generally consider it very important to estimate others are first, their intellectual ability; and secondly, their ethical sense. We call these "mental and moral qualities," and recognize that they are more or less distinct and separate.

In common with all other living beings, man lives in competitive life; and so fundamental and continuous, from the earliest existence of life in the world, has been the necessity of alertness and observation in order to survival and continuance, that man, in common with all other sentient beings, has acquired a constant sense of insecurity on account of rivalry. We are all born with an instinctive knowledge of this fact. It haunts us from our earliest consciousness, and follows us all through life. By highly advanced and improved brain capacity, and by suppression of rival species, man has so widened the distance between himself and lower grades that, comparatively, he recognizes little danger from that direction. His principal rival is his fellow-man.

It is this instinctive sense of insecurity on account of rivalry, that begets the instinctive habit in us of grading and estimating our fellows.

We wish to know at once how formidable a competitor our new acquaintance will prove; hence we promptly grade him in intellectual ability; and we wish to know whether he will conduct his competitions or associations with us in accordance with established and advanced rules of decorum and propriety—hence, with equal promptness, we grade him in ethical sense.

By the long progress of practice, we have become exceedingly expert in this kind of work. Some boast they can frame an opinion from a slender foundation as expression of face, a cut of the eye, the step on the pavement, the handwriting, the tone of voice, or style of dress. Of course such expressions are exaggerations, still they show how adept we have become, and how much we value such information.

As we estimate men in these particulars, we grade them into types, from the lowest savage who is both very ignorant and very immoral

the highest civilized, who is both highly intelligent and highly moral. Between these extremes there is every conceivable grade, variety and type.

In the gradual rise of man from the state of savagery to that of civilization, his steady progress is occasioned by and marked by gradual improvement in both these particulars. There is a steady improvement in him of intelligence, and a steady improvement in him of ethical sense.

We readily recognize that the person who succeeds and excels is the intelligent one. He surpasses others in the competitions of active society. Intelligence is very plainly a double qualification. I would divide it into two parts: the inherent brain-ability of the person to think—intelligence, and the acquisitions he has made by thinking—knowledge. Ability to think is by far the most important, and whatever tends to improve or lower this qualification of the person tends to raise or lower his amount of knowledge, and his chances for success in the world. The person with a high order of brain capacity can and does acquire knowledge as the occasion requires. By intelligence, therefore, I mean capacity to think and knowledge combined.

In the slow and gradual advance of man, through generations, from a savage condition to a highly civilized one, it is the gradually increasing necessities occasioned by the competitions of more and more complex society, that force him, in order to avoid suppression and elimination, to steadily improve his brain ability to think. The elimination of those least fit in brain capacity, and the survival of the more fit, is the natural method of gradual improvement in humanity. The original source of improved capacity and of accumulated knowledge, that is, of intelligence in the world, is therefore competitive life, and it is very easy to trace back all varieties of intellectual ability to the gradually acquired brain capacity that has been the result of the struggles for existence and for ascendancy, carried into the more and more complex and refined methods and habits of advanced society.

As society advances, we notice that not only there is an advance in intellectual qualifications—in ability to think—but almost *pari passu* with this line of capacity, there also is acquired another habit of thought, namely, an ethical sense.

As soon as human society begins to grow complex, then arises the public necessity that the competitions of its membership shall be regulated. Families, communities and races soon become themselves aggregated into wholes, individualized, because they become competitors with other families, communities and races, and public good demands that the internal rivalries of their members shall be so harmonized and so adjusted to each other as to subserve general welfare. Public safety demands ethical observances, and a

large proportion of the efforts and powers of society are spent in the inculcation of rules of conduct that relate to public good; in this the rules, laws and government of society, with the moral sentiment and public opinion that back them, as men become intelligent, become of a higher and higher grade, until those that harmonize and adjust the associations and competitions of the most advanced society are reached.

For these reasons the individual member of advancing society, besides becoming by competitive practice more and more capable intellectually, at the same time, becomes more and more habituated in the performance of ethical observances. The habit of adjusting conduct ethically, that is, according to established rules of society and the rights and wishes of others, becomes more and more fixed as a trait of character.

My object in this sort of observation is to draw attention to the fact that the tests by which we grade and classify our fellows—their intellectual and ethical abilities—are the results of the gradual practice and exercise to which men have been submitted through generations on generations of advancing, developing existence.

A most advanced man, therefore, is he who has such intellectual ability to think, that he can so understand the complexities of advanced society as to be able to formulate and promulgate the highest and best rules of conduct, and has such an ethical habit inherent in him that he holds true by an educated conscience in the observance of them.

The highest type of man, in short, is he who has the highest intellectual sense, coupled with the highest ethical sense.

Brain strength, like muscle strength, is the result of previous practice and exercise. All-round ability is the result of all-round work, and specialized accomplishments are the results of special kinds of practice. In brain-work, as in muscle-work, the exercise, in order to be improving, must reach the degree of being effort. Unless there is a constant sense of effort in muscle-work, muscle strength does not improve; the same is the case in brain-work. Brain-work is therefore necessary in order to continue brain capacity; and in order to raise the level of capacity, increased effort is necessary. Previous activity alone produces capacity; continued activity alone continues capacity; and increased activity alone increases capacity.

The previous activity that produces capacity is either ancestral or individual. In biological descent the individual only represents one link in a chain of activity. The person gets his ability from the line of his ancestry—receives it at a certain level, and maintains or raises it solely by his own activity. Heredity means no more than the continuance in the line of the habits of action established in the ancestor. Of the two

elements of intelligence which I have mentioned, viz.: capacity to think and knowledge, capacity is inherited, knowledge is not. Knowledge has to be acquired, but by far the greater part and the best part of the capacity is inherited from ancestry, and is the result of previous ancestral brain exercise.

Brain abilities are not constant qualities; they vary in the life of the person and in the line of descent according to habits of thought. Practice alone produces; practice alone continues; and increased practice alone increases brain abilities.

According to these rules, our high-grade intellectual person is the result of previous ancestral and individual intellectual practice, and is, at the same time, ethical to a high degree, because of high-grade ancestral and individual ethical practice. The highest type of man, the one highly intelligent and highly ethical, is solely the result of the practice of both these kinds of brain work, and can occur only in that sort of advanced society which has been active and industrious, so as to have necessitated brain activity on the part of its members, and in that sort of society where the study and observance of high ethical rules are a constant practice.

No community, no matter how civilized, is uniform in its membership; we can find low types of men everywhere. In the most advanced society its membership will grade from the highest type—highly intelligent and highly ethical, to the lowest—very ignorant and very immoral. Brain abilities are not constant qualities. There is no constant level of capacity; it rises and falls according as the brain is practiced or not practiced.

While, therefore, we may state that activity improves capacity, we can with equal accuracy assert that inactivity lowers capacity. Much—probably most—of the impaired or lowered brain capacity in society comes from brain idleness. Functional capacity begins at once to lapse if functional brain activity is abated. We witness this on all sides: whatever conditions, due to wealth or poverty, conduce to lessen functional brain work, tend to impair intellectual capacity to think, and the ethical sense to do right. In the idle wealthy ranks and in the idle poor ranks we find most degeneracy. The active, industrious middle class carry the main current of improvement. Improvement is only found where there is activity, and degeneracy is always an accompaniment to idleness. Society sloughs off at its two inactive idle extremes. If you study the conditions that lead to brain work on the one hand, and those that lead to a cessation from brain work on the other, you have much of the secret of improvement and of degeneracy, in the individual, in the family, in the community, and in the nation. There is in this way a very

ready, because a very physiological, explanation of much that otherwise is strange and difficult to understand. Families lapse from wealthy positions into poverty in the course of one or two generations, because the necessities for brain work having been removed, degeneracy comes with the condition of inactivity. Races and nations readily follow the same course. A very large proportion of the incompetent and the vicious elements of society is made up of the lapsed members—of those whose lines of capacity point downward. Almost every family can be said to be tending towards survival or towards elimination, and the cause of their tendency can be readily learned by observing whether their brain habits are active or inactive.

The competitions of active, industrious society determine the levels of its members. The incompetent poor classes become poorer, occupy unfavorable and unhealthy positions, and eliminate rapidly; while wealth induces idleness and degeneracy, and consequent inability to add to, or to even hold to the property that parental or ancestral capacity may have provided; in time the rich disappear, or "the top rail goes to the bottom," to be eliminated in the poor ranks. In our rapidly changing American society, it is very common to find in the second or third generation the relics of once wealthy families, unable now to compete successfully for a living because of degeneracy in intellectual ability, and with ethical habits alongside the very lowest.

I have probably said enough to warrant the statement that brain activity alone induces brain capacity, and that brain inactivity induces brain incapacity.

In this observation, we notice that there is only one way of improving capacity, namely, by activity; but when we turn to the converse proposition, we recognize there are several ways of lowering it. Inactivity, I have said, induces most of the incompetency, but it does not produce all. It does it by impairing the brain's ability; but the brain's ability is also lowered by whatever else, in any other way, impairs or injures its structure. Functional capacity depends upon structural integrity. Any defect, injury or disease of the brain lowers its capacity; and we judge the pathological disability by the same tests that we use in grading physiological disability; that is, we witness there is always more or less impairment in intellectual and ethical capacities in brains pathologically impaired. In all our insane asylums we find persons who once were graded high in intellectual and ethical abilities, now sadly lowered in both these qualifications. We estimate the insane by the same tests we estimate the sane. In a large majority of cases the decision is easily made. It is only in those cases when the insane degree of disability is not yet quite reached, but is approaching,

and it is necessary to anticipate it, and in those cases when the disability is transient and questionable, that the expert is required.

The methods of brain degeneracy I have thus far mentioned are, foremost and principally, brain idleness, and next, those pathological conditions which are the results of disease, injury or defect; but there are other causes at work in society, by some not recognized or classed as pathological, which question I won't stop to discuss; and these causes, in my opinion, are very potent—probably, next to brain idleness, the most potent in modern brain degeneracy. I allude to the widespread and abundant use of brain drugs, the principal one of which is alcohol. Next to brain inactivity, I believe brain injury with drugs, especially alcohol, produces most modern brain degeneracy. In proportion as the amount of alcohol in the circulation is increased, in addition to a lessening of sensibility, we witness a gradual lessening of intellectual ability. This declines through descending stages from the condition in which we describe the person as a "little off," intellectual capacity slightly lowered, judgment and accuracy of thought slightly defective, to that condition where there is entire loss, and the man is a temporary dement.

In proportion, too, to the amount of alcohol taken, we witness ethical ability to be lowered, and the cerebral disability in this particular will be exhibited in descending stages, reaching from slight loss of the sense of propriety and decorum to that condition in which the person is such a nuisance, or is so degenerate to his associates, that he reaches the degree of temporary mania, and has to be restrained.

These effects of alcohol upon the brain will vary in different persons. Callous brains exhibit impairment to a degree than more sensitive ones; low grade brains reach the savage level sooner than highly advanced ones, and defective, injured or diseased brains exhibit their failures in the lines of their deficiencies.

The length of time, also, that the alcohol use is continued increases the degree of disability. A single debauch can be readily recovered from, but long-continued use leaves such impairment that only in rare cases does complete recovery ensue.

Sometimes we have these conditions all superimposed in the same person; that is, we have a considerable quantity taken by a brain already weak or defective, and the drinking is continued a long time. This is the case with the majority of those whom we call inebriates. In a majority of cases the brain of the inebriate is originally low-grade, and nothing could be done to more effectually lower its capacity still further. But it matters not whether there is original weakness or not, a sufficient quantity, long continued, will bring down, in intellectual and ethical capacity, the

most advanced brain to the level of the lowest. Whenever an idle, incompetent brain is rendered still more incompetent by the chemical effect of a drug, degeneracy and the consequent elimination of the person and his lines of descent is rapid indeed; and this happens not nearly so much by the injury to other structures and organs of the body, so as to induce death directly, but, because the injury to the brain places the person, by his loss of intellectual and ethical capacity, in unfavorable, poor and vicious surroundings and indirectly causes the elimination of himself and his line.

Brain injury with drugs produces a great deal of modern brain degeneracy, and, in connection with brain idleness, is an exceedingly rapid eliminator in society. The popular and indiscreet use of alcohol, nicotine, opium, and similar drugs, is a very potent factor in modern degeneracy.

The application of the above principles to the explanation, on the one hand, of success and survival, and on the other, of failure and elimination, is very interesting.

We are very apt to lose sight of the rapid rate of human elimination. What is a possible or normal rate of increase is never reached by any people; causes of elimination are constantly at work to keep the increase below the normal rate. If every human female who is born reached adult life, and bore a reasonable number of children, directly, there would not be standing-room in the world. The grade of brain ability, as I have said, is the factor that, more than anything else, determines a person's position in the world; and a physiological consideration of the causes that lead to increase or decrease of these faculties is seldom heard; yet it is a most rational way of dealing with the subject.

Before I close, I think it will prove interesting if I apply some of the physiological principles I have been enumerating to a broader field, and as briefly as possible show how the rise and fall of races run on the same principles that individuals rise and fall in society.

A race is an aggregate of similar individuals—or, more properly, of similar lines of descent. What determines the grade of a race is the level of the aggregate capacity of these lines. The centre of the aggregate potentiality of the race, in the progress of its social dynamics upwards or downwards, varies as an individual's; with, of course, less sudden variations, because of the overlapping of generations—still it never, or seldom long, remains at the same level. Just as much as with the individual, it takes continuous activity to keep up capacity in the race, and inactivity lowers capacity.

We often hear it stated that a race or nation degenerated because they forgot the instructions or accumulated experiences of their forefathers.

The forgetting or the not heeding had very little to do with it. The records of the accumulated experiences of a race's previous history are always abundant, and the alarmed, but gradually thinning ranks of their leaders are continually proclaiming and preaching and teaching them; but the secret of their gradual decline in prestige and power, and comparative influence among other races, lies, as is often the case with the individual in society, in gradual abatement and stopping of previous brain industry and activity. An active race soon reaches a stage of comparative excellence and wealth and power, so as to be relieved of the immediate competitive necessity for continued exertion. When this is the case, it is just as much "human nature" in the aggregate of individuals, as in the single individual, to stop further exertion and exercise.

The ancient Semitic races, who once inhabited western Asia and ancient Egypt, and who long antedated the Aryans of Europe in civilization, grew powerful first and then rich, stopped activity and declined in excellence.

It matters not whether you locate the origin of the Aryan races in the centre of Asia or in central Europe, as is more recently advocated; when first known, they were an active, combative, competitive people in Europe, considered by the ancient Assyrians, Phonicians and Egyptians as barbarous and semi-civilized. Those Aryans who occupied the peninsulas of ancient Greece and Italy, caught up first the civilizations of Asia and Egypt, because they were nearest to them. An active, progressive, advancing race, like the individual, is acquisitive of knowledge as well as wealth. They learned from their advanced neighbors, and by activity themselves became powerful in knowledge and resources; then conquered and plundered the old Semitics, and rose to be the excellent and leading races of Greece and Rome. Greece, the one nearest to the Semitics, improved first and declined first.

In time, the same physiological processes took place with the people of Greece and Rome. They waxed comparatively excellent, the necessity for further exertion was relieved, and they turned the pinnacle of excellence and began the decline of the other side because of brain degeneracy—not because they had not the accumulated wisdom and wealth of the world, but because the aggregate of their brain capacity lowered in level for the want of the continued brain practice and exercise necessary to keep them up. The aggregate capacity of the nation to think and to act ethically declined.

Defended by the mountains to the north of them from their kindred Aryan races of central Europe, and having thoroughly demolished the races south of them, the Empire of Greece, and of Rome particularly, had abundant time of idleness and inaction to become thoroughly degener-

ate; so, when the hordes from the north poured over the mountains, these empires sank easily. The darkness that followed the submergence of these ancient civilizations, was for a time so complete and dense, because the Goths and Vandals were themselves not able to appreciate and appropriate the civilizations that they destroyed. They conquered Rome too soon, before they were themselves ready for it. "The dark ages" were the result; and if it had not been for the Arabs in Alexandria, who worked round the coast of North Africa, and into Spain, keeping up the lamp of civilization, with the help of the Jews and Greeks they imported to teach them, the light of civilization would have been almost totally submerged. The Moors of Spain took eventually the same old routine course, before the gradually improving Aryans of central Europe; in their turn became rich, inactive, and disappeared.

Those Aryan nations of Europe who to-day hold their positions of highest excellence in the world, have solely reached their eminence by their improved brain abilities—the result of generations on generations of advancing brain practice.

A semi-civilized king of Asia or North Africa may think in his visit to London, if he had all the wealth and vast material resources of England transported to his country, his would be a nation equally as great. Nothing is more mistaken. The only way for his people to reach the proud eminence of excellence of the British Islanders, is for them to have gone through the same long processes of industrious, persevering, high-ordered brain practice, similar to that through which these people have passed. It is the work of generations, and cannot be donated in a day.

In this connection, it is interesting to notice to what degrees and at what levels the different savage, barbarous, semi-civilized races of the world have appropriated the civilization of Europe, as it has, in the intercommunication of modern commerce and travel, and by teachers, been conveyed to them. There are hundreds of illustrations in the world of the fact, that a low grade race accepts and runs advanced civilization just at the level of their inherent ability. A singular observation, connected with this fact—often some test of competitive ability, in war for instance—is necessary to show the superiority of the advanced race to the inferior one, so as to make it ready to appreciate and learn.

The inhabitants of the Pacific and Indian Ocean Islands are good illustrations of these principles. Those inhabitants, who by ethnological tests show themselves to be descendants of the more advanced races of Eastern Asia, have appropriated civilization at more rapid rates than those types similar to the races of Southern

Asia and Africa. At one extreme, we may mention the notable examples of the Sandwich Islanders and the Hoovas of Madagascar, both of Eastern Asia types; and at the other extreme, the Andaman Islanders and the inhabitants of Tasmania and New Zealand, of African type. Of the Eastern Asiatics, the Japanese exhibit, in all particulars, more activity, and consequently more progressiveness, than the Chinese, the Malays or Burmah races. The ancient civilizations of these races were among the first in the world, but, in the case of the Chinese particularly, the rigidity of too crowded a population suppresses improving activity.

I could take the range of the world to illustrate these principles, but have not the time. It may prove more instructive to come closer home.

In America we have three very distinct types of men—the Indians, the Africans and the European whites.

It is a remarkable fact, low-grade races melt away and disappear in the presence of the more advanced ones. In modern times they are not exterminated by war; very few are killed out; still, they rapidly disappear. Whole tribes contiguous to the English and European colonies in Africa have disappeared, and in Australia they are melting away like our Indians. The last Tasmanian has been said recently to have died, and the English government, out of sympathy, has recently been gathering together the few natives of New Zealand as ethnological curiosities.

When an advanced race, as the Europeans in America, for instance, occupy the country of a low-grade race, and attempted to force them to assume the methods of civilization, the change of the brain habits of thought is too sudden for the inferior race to assume. In civilized society, as I have shown, persons of low intellectual and ethical abilities occupy the eliminating grades. To force an inferior people, never practiced or trained in the habits of industrial competitive thought, into the ranks of a civilized race, is equivalent to forcing them into the eliminating grade of that society. The Indians have nowhere been able to enter into industrial competitive life with the Europeans and survive, but, wherever it is attempted, they simply assume the position they are capable of taking; in common language, they become poor and vicious, and are eliminated along with the eliminating whites. The vice of civilized society, to which they take with avidity, is alcohol drinking; and nothing contributes more rapidly to increase their incompetency and viciousness. As with low-grade individuals in advanced society, alcohol is a most rapid eliminator of low-grade races. The general government, in its management of the Indians, finds it has to prevent their access to alcohol, and the missionary among them, in his

endeavors to arrest the current of their downward degeneracy, finds his efforts futile, if drink is allowed. The elimination of the Indian races is due principally to these causes; first, it is impossible for the Indian to assume so suddenly the habits of civilized thought which are necessary in order to prevent elimination. For the same reasons the hyena and eagle in confinement become unprolific and defective in descent, so does the Indian; and he often adds rapidly to his degeneracy by drink habits.

When the Spaniards discovered America, they set out at once to enslaving the Indians. They did this first on a large scale in the West Indies, by the hundreds of thousands. The sudden change of brain habits was so severe and extreme that these races exterminated excessively. To-day there is hardly a relic to be found. They proved so unsuitable for slaves, the Spaniards had soon to import Africans.

The Africans, from the remotest antiquity, have been preyed upon by other races for slaves. From the eastern side of the continent, next to Asia, they have been raided most, and are still so to-day. On the west coast, whence America received her slaves, they had been before that for thousands of years unmolested and least mixed with Asiatics. They had, among themselves, varied to some extent into grades, according to activity, climate and surroundings. The lowest types of men in the world were found among them, while some were somewhat advanced. The characteristic that rendered them suitable for slaves was, they were passive in disposition, and would bear pressure and moulding. After African slavery had begun in the West Indies, it was soon extended to the continent.

The two hundred years that slavery continued in the United States under its extreme artificial conditions, it exerted powerful modifying influences upon both the Africans and their European masters.

The Africans, for four or five generations, underwent forcible practice in very much more advanced brain activity than they ever performed before. The African, originally, with very moderate exceptions an abject savage, was rapidly made to assume the language, dress, customs and conventionalities of the whites, and practice their habits of thought as far as he was able to understand and imitate them. Each one may be said to have had a private tutor of his own. It is true, the master's interests directed and largely controlled their brain practice; selfishly, in many cases, he directed his slave's habits and labors; still, involved in all such work, was brain exercise of a higher order than the African ever practiced before. His muscles were exercised, his food directed, and his improved sanitary condition brought his average general health to a higher level. At the time of their emancipation

there could not, in my opinion, have been found in the world six millions of people, in a body, to excel the American slaves in three essential particulars—general healthfulness, prolificness, and sobriety. These excellences were the results of two or three hundred years of artificial selection and improvement. In brain work, higher intellectual and ethical practice and instruction was the result of simple association with the whites, as well as the result of direct efforts on the part of the whites to improve them. The selfish interests of the whites dictated, probably, most of their efforts; still, some were incited by the highest altruistic motives. Upon the whole, the American negro emerged from slavery improved above his original grade in intellectual and ethical capacities; and his was an example of more rapid advancement than has ever been witnessed before in such a type of people in such numbers.

The national processes of improvement by activity, and of deterioration by inactivity, had obtained to some extent among the tribes of Africa, which made slight variations in the types imported as slaves, and probably still hold in the grades among them; but the artificial and forcible influences which obtained all during slavery, by training, association and education, and are still continuing, in the efforts made to improve and govern them, together with miscegenation, have tended to advance some few lines toward comparative ability to compete, and toward continuance and survival; but the large majority are taking their natural level in the eliminating grades of society, and prove an incubus upon the country's progress. The race is certainly letting down in the three particulars in which they excelled—of healthfulness of system, of prolificness, and of sobriety. Among those, braced up by, and floating along with, the currents of activity established and maintained by the whites, most examples of improvement are found. But in these sections, where they are in large majorities, and left to their own exertions, intellectual and ethical deterioration is very apparent. Statistics show very rapid elimination of them in the towns and cities, where competitions with the whites force them into most unfavorable surroundings.

That the negro, in the South, is seen to fill the prisons, the police courts and the penitentiaries is an exhibition of a natural condition; he is living under a civilization and a code of laws that he is not able himself to formulate or maintain. He fails ethically, as well as intellectually, in larger proportions than the whites, because he is not as capable in maintenance of the kind of activity his surroundings demand. But I have not the time to pursue this question further.

It is only necessary, generally, in the case of the European whites in this country, to apply

these principles, to have ready solutions of the changes going on in our different communities and in our national society. The wholesale importation of the degenerating classes of the old world is having a most deteriorating influence upon our national, intellectual and ethical level. As the good of society feels the fluctuations in the ethical currents first and most, we can see the deterioration, even in high places, due to this influence. Brains degenerated in capabilities, by the rigidity of the strata in European society, which prevents all kinds of activity, except muscle drudgery, are filling our land faster than the three or four generations necessary to elevate them can counteract. We have not yet invented a cerebral dynamometer by which we can quickly test a man's intellectual ability and his ethical strength. Such a test, however, is sadly needed. Persons who fall below a certain level in these two essential qualifications ought not to be allowed to enter the country, no matter whether they hail from Europe, Asia or Africa.

In conclusion, I insist I have been on purely physiological and professional ground all the way in this discussion. The corollaries I would draw from it are:

1. Brain capacity is solely the result of ancestral and individual brain practice.
2. The test of these qualifications are the grades of intellectual and ethical abilities, usually determined by the level the individual, the family or the race occupies in competitive life.
3. Degeneracies of brain ability are occasioned by brain inactivity, which is the principal method of deterioration; but whatever injures the brain structure impairs intellectual and ethical ability, whether it be traumatism, disease or defect, or abuse with drugs.
4. A great field for the highest order of public sanitation is open in this direction, heretofore almost wholly unoccupied by our profession.

In discussion Dr. Herdman, of Michigan, said:

I, for one, feel like congratulating the members of the Section upon the privilege of listening to such a philosophical paper as has just been read. It seems to me to have presented topics eminently appropriate for consideration by this Section. It is a deplorable fact, disheartening oftentimes to the neurologist and alienist, that many of the diseases with which he has to deal in his daily practice are, in the individual, incurable; but little can be done for them in one generation. The causes and influences that have been at work in bringing about the pathological change are inherited from the ancestor; are the fruit of bad social customs, of imperfect methods of education.

The work of the neurologist, therefore, as a student of brain deterioration, carries him beyond

the immediate to a study of remote causes, which are the chief factors oftentimes in producing the result in the individual he is called upon to treat. Upon us rests the responsibility of pointing out these far-reaching influences, and herein is the most encouraging field for the exercise of our talents as promoters of the welfare of humanity.

It is true, as has been clearly set forth in the paper, that man, in his evolution to the point of greatest efficiency, can only attain that end by healthful exercise of every faculty. Man's constitution is a trinity composed of *physical*, *mental* and *moral* faculties. The perfect man is the product of these three acting harmoniously and carried to the degree of their highest possible development. They constitute a tripod on which the superstructure, when symmetrically built, rests securely. And in the process of development toward the perfect man no one of the three pillars, upon which the final result depends, can be ignored. To neglect the physical, the mental or the moral faculties of his nature; to cultivate one at the expense of the other; to fail to observe the interdependence of the one upon the other, will produce a greater or less degree of deformity, and not the perfect man. The central nervous system is the organism upon which the development of these faculties depends, and by means of which they find expression. The growth of the normal structure and function go hand in hand. What then, we should ask ourselves, are the causes, the influences at work in the race and in society; what are the conditions necessary for obtaining perfection in the harmonious development of man's threefold nature?

These are legitimate subjects for the thoughtful consideration and research of every physician who attempts to enlighten his fellow-man as to the laws to which his nature is subjected, and the forces that affect his well-being in its entirety. And such responsibility rests upon the neurologist and alienist, perhaps to a greater degree than upon any other class of practitioners of the healing art. In him do we expect to find a storehouse of all truth, so far as discovered, which has a bearing upon the evolution or dissolution of man's brain. What then is the value of the discussion of this or that agent in the pharmacopœia in some particular disease, as compared with a study of these principles, which underlie an entire class of pathological conditions?

There is at the present time a strong conviction among neurologists, which is shared by others in the medical profession and by thoughtful men and women among the laity as well, that the man addicted to the use of alcohol in excess is a sufferer from disease; that his brain has undergone functional, if not structural, change, which renders him as incapable of self-control as the idiotic or the insane, and that this condition of irresponsibility is not confined alone to those

times when his blood is saturated with alcohol from recent indulgence or debauch—but that during the intervals of drunkenness he is incapable of acting as a sane man, and should therefore be dealt with, not as a criminal to be turned over to the police only in some fit of bacchanalian excess, but is at all times, until pronounced cured by competent judges, a fit subject for the hospital or the asylum.

This and other social problems of no less import and wide-reaching applications, come within the legitimate range of our purpose; are rather the most vital questions for discussion by the members of this Section, and the paper which has just been read points out the road along which, as a company of specialists, we can do the greatest good to our fellow-men.

Dr. Hughes said he desired to express his appreciation of the worth and excellence of the paper. He was glad to see papers of this kind brought before the Section. Formerly physiological psychology was a subject that emptied the room, but this to a great extent had been changed by Maudsley and Spencer. These writers had attracted general medical attention. Papers of this kind will do much to settle psychical hygiene for both the individual and society.

THE VIRILE AND OTHER NERVOUS REFLEXES.

Read before the Section of Medical Jurisprudence and Neurology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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In a previous communication on this subject (*vide Alienist and Neurologist* for January, 1891), I have called attention to the fact that in a perfectly healthy individual, whose spinal cord is entirely normal, especially in its genito-spinal center, placed supine on a couch without head-rest, nude about the loins, the sheath of the penis made tense by clasping the foreskin with the left index finger and thumb at about the place of the frænum, and pulling it firmly toward the umbilicus, placing the middle, ring and little finger low down upon the dorsum of the virile organ, the dorsum or sides of the penis, near the perineal extremity, then sharply precussed, a quick and very sensible reflex motor response or retraction of the bulbo-cavernous portion will be felt to result from this sudden percussional impression, like that which follows, though less pronounced, in the testicles, after sensory irritation of the inner aspect of the thighs, and known as the cremasteric reflex, with this difference only, the cremasteric reflex is a sudden upward movement of the testicle of the side irritated,

while the virile reflex is a sudden downward jerk. While this reflex, like all reflexes with which I am familiar, is away from the irritating afferent impression, it is in marked contrast with the patellar tendon phenomenon in being away from the heart instead of toward it, as so many reflex movements are. It differs from the ordinary penile erection, and must not be mistaken for it (for it cannot properly be called an erection) in this respect, too, viz., that it is downward, and not upward, and proceeds always from a peripheral and external irritation; whereas, erections more often proceed from direct central (cerebral) impression proceeding downward and outward.

Its action corresponds to the œsophageal reflex, or reflex for swallowing.

This reflex symptom is of important clinical and physiological significance, as will later on be shown.

I have called it the virile reflex, because I think, if properly sought for, it will be actively present in all healthy adult males with normal spinal cords; at least, I have so found it in all. It is absent in infants, and feeble or absent in male children who have not attained the age of puberty.

A number of years ago I ventured the assertion that the absence of the cremasteric reflex would be found of significance in the determination of impaired virility from sexual excess or masturbation. This, subsequent experience has only confirmed. Now this new sign—the virile, the penis percussion reflex, or, as M. Ounanoff calls it, the bulbo-cavernous reflex—present, impaired or absent, gives us another valuable evidence of the vigor, impairment, loss or abeyance of the sexual powers in man.

After prolonged excessive venery it becomes impaired or disappears, to return again with sexual recuperation.

After excessive masturbation, long continued, with accompanying neurasthenia, I have found it impaired, but seldom entirely absent in young subjects. It is not impaired in masturbation when the habit has destroyed the sexual power. It disappears in some cases of chronic meconism, and becomes abeyant in long and beastly intoxication, though often excitable in acute alcoholism. This subject needs further investigation.

It is lowered and abeyant in the later stages of typhoid fever, and I have found it also in the moribund state. I have found it absent in old men who have acknowledged and sought treatment for entire virile incapacity.

It is often, but by no means uniformly, found in sympathy with the other reflexes in spinal cord disease of the lumbo-dorsal spine, as the quadriceps extensor femoris tendon reflex, the anal, vesical and cremasteric reflex, the Achilles reflex, ankle clonus, etc.

This phenomenon may also be elicited by sud-

denly jerking the foreskin after it has been made tense, or by pinching the theca of the penis when it is in this stretched condition. This reflex may be reinforced like the knee phenomenon, but by a different process, viz., the frictional excitation of the glans and body of the organ by means of a brush, or brushing it briskly with a piece of paper. It may also be evoked by electrical excitation, a kind of clonus sometimes appearing after this form of irritation. As I said in my first communication, some skill in palpation—a sort of *tactus eruditus*—is necessary in examining for this sign, the characteristic jerking back of the bulbous urethra within the sheath of the penis being felt only when carefully sought for. It is not ordinarily to be seen.

I have found the sign absent in cases like the following: Pupils unequal, patellar reflex exaggerated, and other evidences of sclerose in plaques, with history of syphilis, and acknowledged feeble virility, and diagnosis by a competent ophthalmologist of optic atrophy. I believe it will be found to be quite generally absent when there is optic atrophy, unequal pupils, and other evidences of cerebral sclerosis, or multiple cerebro-spinal disease of this nature. I have found this sign absent in the status epilepticus, but not necessarily modified in hemiplegia, and exaggerated in cerebral paraplegia.

The following clinical records, made since my first report on this subject, add additional confirmation to the significance of this sign:

Case 1.—Mr. J. B., aged 23, single, locomotive fireman, first presented himself for treatment at my office July 11, 1891, when I obtained the following history: Some three years ago, in alighting from his locomotive running at the rate of 15 miles an hour, he sprained his back, but it did not give him much trouble at that time. About three weeks ago, while perspiring freely, he “caught cold” and the perspiration suddenly stopped—from this patient refers present trouble, though he had an attack of la grippe in February, and about latter part of April, he noticed impairment of motion of right leg. Some four years ago he indulged in sexual intercourse to excess—upon one occasion, had connection seven times in twenty-four hours. He has had no inclination for sexual intercourse lately, thinks he has had sexual desire but about a half dozen times during the past two years.

Bowels constipated, for which he resorts frequently to purgatives. Had an attack of vertigo to-day, and fell to the floor while in the act of yawning. Pulse (sitting) 66; upon slight exertion (walking about the room), pulse increases to 78. Right knee-jerk abnormal; R. quadriceps clonus marked up to origin of muscles—a slight tap below right patella (not sufficient to produce patellar reflex), will cause quadriceps muscle to vibrate. R. knee response below normal, left

knee-jerk impaired, no quadriceps clonus. R. gastrocnemius reflex normal; R. plantar and solar reflexes exaggerated, and clonus follows reflex excitation; plantar surface of right foot hyperæsthetic. Flexion of right foot incomplete one-half, rotation impaired one-half, flexion and extension impaired about one-half. While sitting, he can only lift right leg and thigh about three-fourths as compared to left. Has head and back ache. No spinal tenderness, tender over crest of right ilium and beneath ribs of right side.

Æsthesiometric tests of finger tips give normal results. Numbness of left great toe, but no abnormal æsthesiometric sign. Has slight right scrotal hernia; has phimosis.

Virile reflex impaired, extremely feeble, and elicited with difficulty. Patient put upon the following treatment:

R. Quinia bisulphatis, drachm ij.

Ext. nucis vomicæ, gr. xij.

Ergotine, scrup., ij.

Ext. belladonnæ,

Aloin (Merck), āā gr. iij.

Liq. potass. arsenitis, gtt. xv.

Misce, et fiat cap., No. xxxvj.

Sig. One three times a day.

R. Sodii bromidi, oz. iss.

Aq. menth. pip., q. s. ad. oz. vj.

Misce, solve, et Sig. Tablespoonful at night.

Patient reported some three times at intervals of a week, and a marked improvement was observed. He then left on a trip, to return unless the improvement continued uninterruptedly, and I have not heard from him since.

Case 2.—Mr. Chas. E. H., 21, occupation farmer, single, applied at my office for treatment August 15, 1891, and gave the following history: About a year ago, he slept on the damp ground for five successive nights, each morning he felt stiff, and head was very sore. As the effect of this, he was sick in bed with fever for a week or more, legs were paralyzed, bowels constipated, and urine retained—was catheterized several times. He was attended by two local physicians. Says he suffered severe pain during first three weeks of illness, and was troubled with erections. Patient's present condition is as follows: Pulse 90 (patient sitting) and full, temp. 100° Fah., appetite and digestion good, and sleeps well; no erections at present. Some pain in lumbar and sacral region. Crosses right leg over the left with difficulty, cannot lift leg without the assistance of hands, cannot stand alone. Patellar tendon reflex is absent, virile reflex present, but impaired, cremasteric reflex normal, and has abdominal reflex. Has never had syphilis, or any zymotic disease.

Patient placed upon the following treatment:

R. Quiniæ bisulphatis, drachm ij.

Ext. nucis vomicæ, gr. vj.

Ext. ergotæ, gr xxiv.

Fowler's sol., gtt. xl.

Misce. Tiat. cap. No. xxiv. Sig. Take 2 capsules three times a day—in the morning, after dinner, and at bedtime.

R. Sodii bromidi, oz. iss.

Kalii iodidi, oz. ss.

Syr. Hypophos. comp. (Fellows'), oz. iv.

Liq. pot. arsen., dr. j.

Aq. menth. pip., ad., oz. vj.

Misce. Solve, et Sig. Teaspoonful in the morning and 2 teaspoonfuls in the evening.

I select and epitomize a few cases from my earlier records as follows:

The first three were middle aged, of these, the first was married, and gave a history of syphilis, brewer by occupation, erections feeble, white atrophy of retina, unequal pupils—left larger than right, vision obscure in both eyes, cerebrospinal sclerosis (multiple and lateral).

The second gave a history of former syphilis, though at time of observation he was in good flesh and general health excellent, miller and merchant, lives in country; impotent—seldom has erections, but at times has good erections and completes the sexual act.

The third is impotent, fails to have erections.

The next two are children under twelve years of age; of these, the first is a country boy and has epilepsy mitior, the second, also a country boy, has epilepsy gravior.

Another case was that of a civil engineer, single, aged about 28, with nocturnal epilepsy from excessive masturbation.

Additional experience since the discovery of this important diagnostic sign only confirms the conviction uttered in my first paper, viz.: It should receive further consideration at the hands of neurological clinicians, for it appears worthy a place in clinical neurology with Westphal's paradoxical contraction, Erb's reaction of degeneration, or any of the hitherto recognized diagnostic reflexes, or clonuses.

I have found an analogous reflex to this phenomenon in healthy females.

It may be elicited in normally vigorous persons when that condition of the organ is present that we find coëxistant with a desire for coitus, when the sexual act is about to commence, and shortly after coitus, if the sexual desire has not been gratified to satiety. It can be evoked during priapism, and during penile relaxation, if power for a second coitus remains in the organ.

In conclusion, I think we are on the verge of further most important discovery in the direction of physiological and pathological reflex phenomena, and on the verge of an enlarged comprehension of their value in diagnosis and prognosis. I believe that every part of the body supplied by an afferent (sensory) nerve communicating with a center, whether cerebral, spinal or ganglionic, capable of an efferent or motor response, will be found susceptible under appropriate stimuli (electrical, mechanical, or special) in normal or pathological state, responsive in some way, and that

this plus or minus responsiveness is yet to have far more remarkable value in clinical estimation than is now accorded it or dreamed of in medical minds. For instance, in our clinical investigations, we take into consideration such purely physical reflexes (in addition to the cardiac and visceral movements) as the palpebral, pupillary, naso-pharyngeal, vesical, cremasteric, anal, and the tendon reflexes of the lower and upper extremities, normal and abnormal, and the clonuses which are of the nature of reflex phenomena prolonged into rhythmical movements.

Many of these are more or less influenced by conditions of psychical inhibition.

Then we have in disease often to consider the state of the psycho-physical reflexes, as the involuntary shedding of tears, unintentional, or causeless weeping, involuntary and unsuppressable laughter, shouting, involuntary exclamations of various kinds, as of fear, disgust, joy, etc., and sudden involuntary and unrestrainable psychomotor responses of various kinds, virile erections under erotic psychical impressions. These latter are downward influences, reflex responses from psychical excitation through peripheral impressions transmitted through sight or other senses, or originating altogether in ideational center. Then we have the psychical responses to peripheral impressions, such as the sudden mental states and expressions following physical impressions, like the immediate outcry of peripheral pain—the true nature of a reflex phenomenon wherever we find it being a peripheral impression transformed into an immediate, or almost immediate, motor response or expression.

If we take into consideration how much of our power for regional diagnosis has been aided within the past few years by what we already know of these reflexes, especially of the knee jerk, Achilles reflex, the foot clonus, the anal, vesical, cremasteric, and virile, how much more may we not hope for with confidence, if we but persevere in our search for yet unknown manifestations of these phenomena? I have already elicited in certain moribund states, an oral reflex, as heretofore announced, and a physiological anal reflex; and have confidence even before its announcement, not knowing it was new, much that Rosolimo asserts concerning the reflex of the anal sphincters, this latter reflex serving as an especially valuable differentiating test where sexual failure is to be early distinguished from commencing vesical or rectal paralysis.

A CHEAP DISINFECTANT.—The nitrate of lead is the cheapest disinfectant known that fulfils its intent. It does not, however, prevent putrefaction. The chloride of lead is much more effective in all directions. It is made by dissolving a small teaspoonful of nitrate of lead in a pint of

boiling water; then dissolve 2 full teaspoonfuls of common salt in 8 quarts of water. When both are thoroughly dissolved, pour the two mixtures together, and when the sediment has settled you have 2 gallons of clear fluid, which is the saturated solution of the chloride of lead. A pound of nitrate will make several barrels of the liquid. The nitrate of lead costs from 18 to 25 cents a pound at retail.—*Med. Bulletin.*

THE JOURNAL OF BALNEOLOGY.—It is announced that Dr. J. N. Bell, of Brooklyn, Dr. Frank Woodbury, of Philadelphia, and Dr. Geo. H. Rohé, of Baltimore, are to be the editors of this journal, in the departments of balneology, dietetics, and climatology, respectively.

PULMONARY TUBERCULOSIS TREATED BY HYPODERMIC INJECTIONS OF ARISTOL.

On Sept. 15, 1891, M. Herard read before the Paris Academy of Medicine, a report by Dr. Nadaud, upon this subject. An abstract of it is printed, as follows, in *La Semaine Medicale* (No. 46):

After having observed the excellent effects of Aristol upon scrofulo tuberculous lesions, and found that Aristol was perfectly innocuous in internal medication, M. Nadaud decided to make use of hypodermic injections formulated as follows:

Oil of sweet almonds (sterilized) 100 c.cm.

Aristol 1 c.cm.

The solution should be filtered.

Nadaud's first injections were made upon a child, æt. 7 years, who, after an attack of coxalgia, had developed several abscesses followed by fistulous tracts. One cubic centimetre of aristol was injected daily. After twenty-five days of treatment there was no trace of suppuration to be seen.

In consequence of this result, Dr. Nadaud decided to test the value of hypodermic injections of aristol in the treatment of pulmonary tuberculosis.

Twenty-three patients suffering from tuberculous lesions of the lungs were successively treated by injections of aristol without any other medication whatever.

In seven cases the amelioration was so great as to induce the belief that complete cures had been effected. The treatment covered from twenty-five to thirty days. The amelioration has continued up to the time of this writing, *i. e.*, from three to four months.

In five of the twenty-three cases there was a prompt amelioration, but, a month after the cessation of treatment, some symptoms were observed which seemed to call for a second series of injections. Generally, the relapse was of slight importance, and the patients in this category soon resumed their habitual occupations. In no case was it necessary to make a third series of injections.

The rest of the cases are still under aristol treatment.

In concluding his paper, Dr. Nadaud said: The effects of aristol are promptly observed usually on the sixth or seventh day of medication and are first manifested by a diminution of the cough and a suppression of the night sweats.

After twenty or twenty-five days of treatment we generally find that the patient has increased in weight.

Aristol gives its best results in the first and second stages of pulmonary tuberculosis. The injections do not cause inflammation, irritation, abscess, eschar, or induration.

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SATURDAY, NOVEMBER 7, 1891.

TRICHINOSIS TREATED BY FOWLER'S SOLU-
TION OF ARSENIC.

In the *New York Medical Journal*, September
19, is reported a case of trichinosis treated by
FOWLER's solution of arsenic, with recovery.
The reporter is DR. W. H. MERRILL, of Pepper-
ell, Massachusetts, and the patient was an in-
mate of the Ward's Island Hospital, an Italian
immigrant aged twenty-five years. The cause
of the disease was believed to be the ingestion
of Bologna sausage, which took place about
twenty days before the admission to hospital; the
partaking of the sausage in this instance, more
than any other former ones, was emphasized by
the fact that the man was made unwell by it; he
had vomiting, diarrhoea, anorexia and gastric
pain, also later some hoarseness and cough. At
the time of admission, the muscular and articu-
lar symptoms strongly favored the diagnosis of
trichinosis, which was confirmed on the second
day by the harpooning of a muscular specimen
from the patient's right biceps. This exhibited
an abundant number of trichinæ in their earlier
molt form. None of the parasites had pro-
gressed to the stage of granular degeneration. A
second muscular specimen was obtained one week
later, and yielded the same appearances. In
the absence of tonic treatment, the patient's condition
grew steadily worse for a period of ten days,

until his condition became decidedly precarious.
A myositis of his masseter muscles had sprung
up which rendered the reception and swallowing
of food extremely difficult. The patient's urine
was scanty, but showed no albumen and no
sugar. The hot-air bath was used, together with
some of the ordinary diuretics, and the quantity
of urine passed in twenty-four hours was brought
up from fifteen to forty ounces; and that was
the average excretion during the remainder of
the man's stay in hospital. FOWLER's solution
was given in five-drop doses, to be increased
three drops per diem until the constitutional
effects declared themselves. For two or three
days after this treatment was begun the patient
did not improve, and in fact seemed fatally ill;
but on the fifth day some slight change for the
better was noticed, in the return of appetite and
some lessened rigidity of the jaw-muscles; and
soon the pulse began to grow stronger. The
pain and œdema about the joints then began to
subside. The improvement during the next ten
days was continuous and fairly rapid. The skin
over the abdomen showed striæ, somewhat re-
sembling those seen upon the abdominal integu-
ment of a pregnant woman, which extended
downward and outward. The cause of these
marks was obscure, since the patient had not
had any hyperextension of the skin sufficient to
account for such striation. The limit to which
the dose of FOWLER's solution was raised was
thirty-six minims in twenty-four hours. The
dose was intermitted or reduced whenever arsen-
ical symptoms were reached. The author be-
lieves that this is the first case on record where
arsenic was used for trichinosis, and he shows no
inclination to base any far-reaching conclusions
on this solitary case. But he publishes the re-
sults as being, to all appearances, sufficiently
prompt and satisfactory to warrant others in
making a trial of arsenic, in default of a knowl-
edge of something better. The author suggests
that the good effects of arsenic in his case were
due to the germicide properties of the drug, and
to the great facility with which FOWLER's solu-
tion diffuses itself through the body. Arsenic
not only increases the activity of capillary circu-
lation, but over certain forms of cells exerts a
power to compel retrograde metamorphosis. It
is possible that some combination of these phases
of drug activity may either destroy or abbreviate

the life of the parasite. DR. MERRILL devotes the closing portions of his paper to a rapid survey of the various drug treatments of trichinosis that have been most successful in Germany, where the recorded cases of trichinosis are far in excess of those of any other nation, and he does not find any drug that promises any better results than arsenic. Among the agents that have been tried have been alcohol, glycerine, the picro-nitrate of potassium, and the salts of calcium. FIEDLER has used large doses of glycerine, but experiments made upon dogs which had been fed upon trichinous flesh were found not to be benefited by that drug, even in very large doses. It would be interesting to see a similar line of experiments undertaken with regard to effects of arsenic upon infected animals.

THE HEART IN DIPHTHERIA.

It is well occasionally to have our attention directed specifically to an important symptom in a disease, particularly if that symptom be only occasionally manifested. Every practitioner knows well that sudden heart failure is liable to occur in diphtheria, and understands the importance of rest in connection with it, but it is to be feared that this knowledge of the subject is not always followed in practice.

The cardiac complications of diphtheria is the subject of an essay by DR. WM. C. DABNEY, of the University of Virginia (*Va. Med. Monthly*, October, 1891), in which he calls attention to three forms of cardiac disorder, accompanying or following this disease:

1. A rapid and feeble pulse, often irregular in force and rhythm. This is the usual condition during diphtheria, and not infrequently continues after the disappearance of the fever.
2. A feeble pulse, which becomes progressively slower until the beats number less than forty, sometimes less than thirty, to the minute.
3. A sudden failure of the heart when all other alarming symptoms have disappeared.

These two latter conditions should unquestionably be considered together. The one is suspiciously like a paresis; the other is certainly a paralysis. When sudden heart failure is recognized as one of the diphtheritic paralyses, its peculiarities are the more readily understood. While palatal paralysis is the more common form in diphtheria, nevertheless it is well known that

any other group of muscles may show the same result, or the paralysis may be general.

The conditions of the throat paralysis may be considered as applying to the cardiac failure as well, frequency alone excepted. The throat paralysis may occur at any period of the disease, but most frequently it is a so called sequel, although recent experiments have shown conclusively that the poison elaborated by the LÖFFLER bacillus may produce it. Similarly, the cardiac paralysis may occur either early or late.

A sore throat, so mild as not to inconvenience the patient at all, and for which no medical relief is sought, is followed by paralysis of the throat, and then for the first time is it realized that the patient has been suffering from diphtheria. Such mild attacks are by no means infrequent, and perhaps their principal lesson is to teach that as one form of paralysis follows such mild cases, so may another form, and that no case of diphtheria is so mild that the heart may be neglected.

The oftener palatal paresis is looked for in diphtheria, the more frequently will it be found. It does not always force itself on the attention by the regurgitation of liquids through the nose, but it is a little surprising to find how many diphtheritics show some nasal twang to the voice. This makes it all the more necessary to watch for the evidences of cardiac failure.

DR. DABNEY does not agree with this view that the slowing of the pulse is an evidence of cardiac paresis, but describes it in the following words: "In many cases which I have seen the earlier symptoms presented no special gravity, but after a week or ten days, when all false membrane had disappeared, the patients seemed to be on the high road to recovery, the pulse, which had been quick and feeble, would gradually become slower without any marked improvement in force. There was a gradual diminution in the frequency of the pulse from day to day—sometimes even from hour to hour—until it fell to forty, or even thirty beats per minute. The only other symptoms noticeable in the case were exhaustion and some degree of restlessness. In no case was there any paralysis of muscles, nor were there any other evidences of multiple neuritis. There was no irregularity of rhythm in the cases as a rule, nor was irregularity in the force of the heart's beat as marked as in the first class of cardiac complications."

The prognosis of the slow and feeble pulse is extremely unfavorable. According to DABNEY it is nearly, if not always, fatal, when the pulse drops as low as forty.

Absolute quiet, both mental and physical, and rest in the recumbent position, are to be regarded as the best prophylactic measures in these conditions.

In the cases of slow and feeble pulse, DABNEY reports that he has used strychnia, atropia, brandy, ammonia, ether, and the other cardiac stimulants and tonics, but without the slightest benefit. It may be suggested that in these cases eliminatives, acting upon the kidneys and skin, such as the alkalies, hot baths, and perhaps even acetanilide or antipyrine might be exhibited. This much is certain—prolonged rest after diphtheria, even if it has been of the mildest type, should be the rule.

OUR GREAT MEN.

The celebrations throughout the world of VIRCHOW's seventieth birthday, October 13, 1891, were merited honors to the great man who has shed so much lustre on medical science. Medicine delights to honor him, and he is no less pleased with the profession which made his great work possible. At the Johns Hopkins celebration of this event, PROF. OSLER took as the subject of his discourse "RUDOLF VIRCHOW, the Man and the Student." He says: "It has been a century of release—a time of the loosening of bands and bonds; and medicine, too, after a long enslavement, ecclesiastical and philosophical, received its emancipation. Forsaking the tradition of the elders, and scouting the Shibboleth of the schools and sects, she has at last put off the garments of her pride, and with the reed of humility in her hand, sits at the feet of her mistress, the new science."

Truly, no one has contributed more than VIRCHOW to the accomplishment of this result. Quite early in life he demonstrated his independence of thought, and lack of regard for existing forms, merely because they do exist, by taking part in the German students' revolution of 1848, and for his pains was dismissed from the minor positions which he then held in the University of Berlin. Was it good fortune that recalled him, or is it impossible to keep down such men?

His famous *Archiv* was started in 1847. With his development of pathological anatomy, and the influence of his work on professional thought, our readers, as physicians, are familiar, but it is not equally well known that his activity in other lines was no less marked than in this. Throughout his whole life he has worked in anthropology, and his contributions to the literature of this science have been numerous and valuable.

DR. OSLER quotes JACOBI, to show his work in archæology: "SCHLIEMANN, by whose modern witchcraft holy old Troy is just leaving its tomb, invited VIRCHOW to aid him in his work of discovery of the buried city. . . . But what has engaged my attention and interest most has been to observe the humanity and indefatigability displayed by the great man in the service of the poor and sick. To read of his constant, practical exertions in behalf of the miserable population of Hissarlik; how he taught the aborigines the efficacy of chamomile and juniper, which grow about them, unnoticed and unused, in great abundance; how a spring he laid open for archæological purposes has been called by them 'the physician's,' and is believed to have beneficial effects; how he was, on leaving the neighborhood, loaded with flowers, the only thing they had and knew would please him, has charmed me intensely. To admire a great man for his professional labors eagerly undertaken and successfully carried out, is a great satisfaction to the scientific observer; to be able to love him, in addition, for his philanthropy and warm-heartedness, is a feast of the soul."

Even these various duties were not sufficient for his active mind, and hence we find that since 1862 he has taken an active part in the work of the German legislature, and for more than twenty years has been an alderman in the Berlin City Council. It need hardly be stated that VIRCHOW, with his liberalizing scientific training has been opposed to the absolutism of BISMARCK.

It is given to but few to rival VIRCHOW as he rivaled GOETHE, in scientific work, but another form of greatness, no less to be admired, can be reached by the many, a form of greatness not absent from VIRCHOW.

FOTHERGILL says of his friend, DR. ALEXANDER RUSSELL, who settled in Aleppo: "The Pacha himself became acquainted with the merit of our deceased friend, consulted him, called

him, his friend, found him upright, sensible and sincere; as a man polite without flattery; decent but not servile; as a Christian, true to his principles; disinterested and generous as a Briton; and in point of skill as a physician superior to every one. A natural, even, cool and consistent temper, a freedom of behavior as remote from confidence as from restraint, improved by reading and conversation; a mind imbued with just reverence to God, and impressed with a sense of the duty we owe; an understanding fraught with the principles of the profession to which he had been early devoted, happily blended with great benevolence, was a character seldom to be met with in the Asiatic regions. This, however, was the character of our colleague."

EDITORIAL NOTES.

GROSS-VIRCHOW.—Soon after the return of Dr. S. D. Gross from his visit to England, where had been conferred upon him the degree of D.C.L. by the Oxford University, it was our pleasure to congratulate him as being the recipient of so many distinguished honors, and that this last seemed a fitting crown and recognition of a long and successful professional career. His reply was: Would you know the highest and most gratefully received compliment ever bestowed upon me? It was when I first visited Virchow's clinic: Virchow was at the time lecturing to the class. An attendant took in my card. Virchow looked at it and hastened to the door where he greeted me, and bringing me forward with both my hands clasped in his, introduced me to his class as the Father of Pathology, and author of the first work ever printed on that subject, and of which he paid me a most profound compliment. I tell you that was one of the proudest moments of my life.

ST. LUKE'S HOSPITAL AT DENVER, COLORADO.—This handsome new structure for the care of the sick was consecrated under the ritual of the Episcopal church, conducted by Bishop Spalding, on Sunday, October 18. The wards are four in number, containing fifty beds, and there are fourteen private beds; there are two beds endowed for charity cases. The present structure will eventually be the administration building, when the planned wards are added. The outlay thus far has been about \$80,000 for land and central building.

SOCIETY PROCEEDINGS.

Mississippi Valley Medical Association.
Seventeenth Annual Meeting, held in St. Louis, Missouri, October 14, 15, and 16, 1891.

(Concluded from page 701.)

SECOND DAY—AFTERNOON SESSION.

Dr. J. W. Carhart, of Lampasas, Texas, contributed a paper on

THE INFLUENCE OF GRAVEYARDS ON PUBLIC HEALTH,

in which he drew the following conclusions:

1. From whatever standpoint this subject is approached it must be with care and gentleness, since the graveyard, though a constant menace to public health, has a pseudo sacredness fostered by the profoundest sentiments of our natures.

2. The method of the disposal of the dead should be founded on reason and not on custom or sentiment.

3. The interment of the dead in the earth was never enforced by a statute, Jewish or Christian, and was merely incidental to both dispensations.

4. No law, human or divine, requires us to dispose of the dead in a manner prejudicial to the health and comfort of the living.

5. Whilst it may be an open question as to the right of the State to decide as to the manner of the disposal of the dead, except in exceptional cases, it is clearly the province and duty of the State to prevent such disposal as will in any wise jeopardize the interests of the living.

6. From all the facts at our command, we are led to the conclusion that the graveyard should become a thing of the past, and that incineration is the method most in accordance with science, sanitation, æsthetics, reason and religion.

7. We would add, as a corollary to these several conclusions, that since the intelligent, broad-minded physician is the almost exclusive guardian of public health in seeking to prevent the development and spread of disease, it is plainly his duty, when cemeteries are being located, to use his best endeavors to have them so placed as to jeopardize as little as possible the public health; and for its moral effect he should encourage efforts to beautify existing cemeteries; and that he should seek, as fast as possible, without too much violence to the tender sensibilities of the masses, to encourage incineration of the dead, or some other method more in harmony with sanitary science than the common modes now practiced.

Dr. J. T. Jelks, of Hot Springs, Ark., read a paper on *Blenorrhœa*.

Dr. Landon Carter Gray, of New York, followed with a paper on *The Present Aspect of Cerebral Surgery*, in which he epitomized the work of Horsley, Ferrier, Keen, and others.

Dr. John A. Larrabee, of Louisville, Kentucky, read a paper entitled *The Importance of Recognizing a Temporary Rachitic Condition in Infants*.

Dr. F. C. Hoyt, of St. Joseph, Mo., read a paper entitled

PACHYMEINGITIS HÆMORRHAGICA INTERNA,
WITH REPORT OF A CASE AND PRESENTATION
OF A PATHOLOGICAL SPECIMEN,

and suggested the following deductions, offering them as a practical and rational view of the subject:

1. That the disease known as pachymeningitis hæmorrhagica interna chronica is not a disease of the dura mater primarily, and not necessarily at all. The name is therefore a misnomer, and the simpler term sub-dural hæmatoma should be substituted.

2. That the condition is due primarily to paralysis or loss of the normal vaso-motor tonus, associated with structural changes in the cerebral vessels, particularly those of the pia mater.

3. That hæmorrhage may, and often does, take place in the substance of the dura from the causes stated in this paper, but that its vascular supply and anatomical structure render it improbable that these hæmorrhages play any part in the formation of a sub-dural hæmatoma.

4. That the hæmorrhage occurs from the vessels of the pia mater primarily, forces its way without difficulty through the upper web-like layer formerly called the arachnoid, escaping into the sub-dural space. The extravasated blood becomes organized, new vessels are formed, and these assist in furnishing the recurrent hæmorrhages.

5. That the inflammation of the internal surface of the dura mater is secondary, and due to the irritation of the extravasation, and then is not general, but occurs only in patches where organic union has taken place.

Dr. Seth S. Bishop, of Chicago, read a paper entitled

CAMPBOR-MENTHOL IN CATARRHAL DISEASES.

(See page 639, JOURNAL of Oct. 24.)

Dr. F. King, of New York, read a paper in which he advocated the poro-plastic felt jacket in the treatment of spinal troubles.

SECOND DAY—EVENING SESSION.

The Association was called to order at 8 P.M., by the second Vice-President, Dr. S. S. Thorn, of Toledo, Ohio, after which President Hughes delivered his address on

MEDICAL PROGRESS.

(See page 651, JOURNAL of Oct. 31.)

Dr. J. B. Hamilton, of Chicago, followed with an address on

THE DRAINAGE OF CHICAGO,

in which he principally dwelt upon its topography. (See page 639, JOURNAL of Oct. 24.)

Dr. Joseph M. Mathews, of Louisville, Ky., delivered a timely, entertaining and remarkably humorous address on the

LIGHTS AND SHADOWS OF A DOCTOR'S LIFE.

The address was punctuated throughout with great applause, and was a relief to the laity after listening to the profound, scientific, and scholarly addresses of the preceding speakers.

At the close of the session the members repaired to the Lindell Hotel, where a banquet was given with all the manifestations of true St. Louis hospitality. Dr. I. N. Love was toastmaster.

THIRD DAY—MORNING SESSION.

Mr. Chas. Truax, of Chicago, read a paper (by invitation) entitled

ARE CONSERVATIVE AMPUTATIONS ALWAYS IN THE INTEREST OF THE PATIENT?

He said that during the past quarter of a century the development of prosthetical science has advanced with a rapidity unprecedented in the history of the art. The first of the two great causes which stimulated this development may be found in the dreadful carnage and mutilation observed in the late civil war, which left thousands of veterans maimed by the loss of one or more limbs, for whom it was necessary to provide artificial substitutes. Experience and investigation had convinced him that the percentage of favorable cases can be largely increased, provided surgeons will familiarize themselves with the necessary mechanism of ordinary artificial legs, and the relations existing between them and the stumps on which they are to be worn, and select their point of amputation accordingly.

From a statistical point of view he finds that out of 2,135 tibial amputations reported to him as being performed between the years 1885 and 1891, 90.7 per cent. resulted in healthy stumps; 3.1 per cent. of stumps upon which compensative appliances could not be worn. Of these tibial cases, 962 were seen by the surgeons after they were wearing, or had attempted to wear, an artificial limb, 86.9 per cent. of which walked with an easy movement and a comparatively graceful step. Of 658 tarsal and tibio-tarsal amputations reported at the same time, 82.7 per cent. resulted in sound healthy stumps; 8.3 per cent. underwent re-amputation, while 3.2 per cent. died, leaving 14 per cent., including re-amputation, upon which prosthetical apparatus could not be worn.

He recommended surgeons to avoid amputating within three inches of the knee-joint. Do not amputate between the meta-tarsal bones and the junction of the lower and middle thirds of the tibia. At all other points they should save all they could, and they will have done in every case, the best for their patients.

INTESTINAL OBSTRUCTION.

This was the title of a paper read by Dr. Henry H. Mudd, of St. Louis, in which he advised early operation.

Dr. C. H. Dalton, of St. Louis, read a paper entitled:

TEMPERATURE NO GUIDE IN PERITONITIS.

So skeptical had he become on the subject that, in considering the advisability of an operation in abdominal cases, he was no longer guided by the thermometer. He takes the temperature in all cases, but does not let the lack of fever influence him against operation when other symptoms, upon which he has learned to place far more reliance, would move him in the opposite direction. Surgeons found it difficult to convince the average physician that a violent peritonitis may exist without a normal, or even subnormal, temperature, for the teaching by some has heretofore been that sepsis is always accompanied by an elevated temperature.

Several weeks since, he was called in consultation in a case of intestinal obstruction, in which peritonitis was in full blast. He advised operation, and was met with the objection that there could not be much peritonitis with a temperature of 99.5° . He pointed in vain to the patient's anxious countenance, to the great tenderness on pressure, a distended belly, the vomiting, the pulse, as well as the fact that purgatives had been tried without avail. The doctor in attendance insisted upon one more dose of salts. It was given. It did not move the bowels, but did move the patient to that place from which no traveler returns. Time and again he had seen cases of intestinal obstruction with stercoraceous vomiting, rapid pulse, anxious countenance (*facies abdominalis*), in which the temperature was about normal or even subnormal. In his earlier experience, the lack of fever in abdominal cases puzzled him very much, and led him astray in a number of instances. While it is well to remember that fever, when present in belly cases, indicates peritonitis, its absence does not warrant us in saying that peritonitis is not present, and should not blind us as to the actual condition.

SARCOMA OF THE DORSO-SCAPULAR REGION.

Dr. Geo. N. Lowe, of Randall, Kas., read a paper on this subject. He reported a case upon which he had operated, the patient, a man aged 18 years, with no history of tuberculosis, carcinoma or sarcoma, recovering. The object of this paper was to show:

1. The necessity of an early operation in all cases of a malignant growth.
2. That some species of sarcoma are more rapid and destructive in their course than carcinoma, especially the spindle- and giant-celled variety.

3. The necessity of having a law to enforce patients so afflicted, as soon as a correct diagnosis can be made, to an early operation, thereby preventing great suffering and prolonging life.

4. That a sarcoma which has grown to an enormous extent, infiltrating the surrounding tissue at any considerable extent from the main growth with cell proliferation, an operation is almost useless as regards a permanent cure.

Dr. W. H. Link, of Petersburg, Ind., read a paper on

APPENDICITIS,

and offered the following conclusions:

In the commencement of the attack, give salines often and liberally until the gut is completely emptied. Advise perfect rest in bed. Forbid any but liquid nourishment. If pain is severe, apply counter-irritation and dry heat until salines act. If patient improves, wait. If pulse grows worse, if temperature rises, if pain increases, if tumefaction becomes larger, if tenderness becomes more marked, operate. At no time give morphia, but consider an increase of pain sufficient to demand relief by opium an imperative, unequivocal and emphatic indication for surgical interference.

RHEUMATISM AND GOUT AS FACTORS IN THE CAUSATION OF ECZEMA, AND THE MANAGEMENT OF THOSE CONDITIONS,

was the title of a paper by Dr. A. H. Ohmann-Dumesnil, of St. Louis. He did not purpose speaking of the etiology of eczema. The only phase which he desired to take under consideration was, in how far rheumatism and gout were concerned in the causation and prolongation of eczema, and what was the proper management of those conditions in order to derive the greatest benefit, so far as the cutaneous involvement is concerned. Naturally this implied that he was about to sustain the position that the conditions named were etiological factors, and such was probably the case. If we took the trouble to examine critically the history, condition, treatment and results in patients, a mass of evidence would be found which, if it did not constitute absolute proof, bore so much weight with it that the probabilities would all tend to confirm and strengthen the position that rheumatism and gout prolong, intensify, and even cause eczema. He had found it to be quite frequent, also, to note that an acid condition was present in eczematous patients. It occurred too frequently to be regarded as a coincidence. Moreover, a correction of this acid condition finds its good effect reflected in the ease with which the cutaneous trouble gave away to proper medication. Whether such cases were inclined to rheumatism or gout it was difficult to say; but that an excess of acid was found in all of these conditions there was no opportunity of denying. For, if eczematous pa-

tients were interrogated in this respect, a large proportion of them would speak of acid eructations, pyrosis, and other evidences of the condition.

In regard to the management of gout and rheumatism volumes had been written, and equally good results had been claimed for different methods of treatment. The most powerful alkali to affect the solubility of uric acid was, beyond all doubt, lithia. The urates of that alkali are the most soluble known, and on that account, a better elimination can be secured. Potash salts run next in value in regard to their solvent value upon uric acid. The soda salts, while exercising good influence, are not as valuable in this respect as either of the others, and the magnesia salts are the least effective.

A question of no mean importance was that concerning the solubility of the various alkaline salts. Chemical investigation has clearly demonstrated that the bicarbonates of lithia, potash and soda are not only the most soluble, but the most easily assimilated by the animal organism. To prevent any decomposition, it is only necessary to dissolve them in carbonated water, which not only keeps them in a soluble state, but also adds to their palatability.

Dr. Enno Sander, of St. Louis, has prepared his well-known lithia potash water, which fills all the indications required, and which acts not only as an anti-rheumatic, anti-lithic, and anti-gouty mixture, but constitutes a grateful table water as well. It not only acts as a curative remedy, but, what is still of greater importance, it is a reliable prophylactic. Its composition is as follows:

Lithium bicarbonate, gr. xij.

Magnesium bicarbonate, gr. x.

Potassium bicarbonate, gr. xvj.

Sodium chloride, gr. x.

Carbonated water, gr. xvj. ℥.

This quantity, one pint, should be taken daily, or the amount increased, it being necessary.

Conditions occasionally arise in which it will be found that a mixture of salicylate of soda and bicarbonate of soda will effect the happiest results in rheumatism, and occasionally in gout. Given in carbonated water, the administration is made pleasant, and the mixture has an effect upon the patient which is refreshing at the time it is taken, and which effects beneficial results in a very short time. When eczema is present, the proper local remedies should be made, and it is astonishing how their action will be accentuated by the internal use of alkalies as indicated above.

Dr. C. A. L. Reed, of Cincinnati, Ohio, read a paper entitled

OBSERVATIONS ON THE MANAGEMENT OF UTERINE TUMORS,

in which he said that there are certain solid tumors of the uterus which require no operation. They are, for the most part, comparatively small

neoplasms, either interstitial or sub-serous; they are indolent in growth, and they do not produce alarming symptoms from either pressure or hæmorrhage. There are certain other myomata of the uterus that are uniformly recognized as demanding operation. They are, for the most part, rapidly growing tumors in young subjects—removable fibro-cystic tumors, soft œdematous tumors, large bleeding fibroids, and those growths which give rise to ascitic accumulations.

Dr. Reed offered the following conclusions:

1. That all persistently hæmorrhagic uterine myomata, of whatever variety, should be advised to early operation.

2. In young subjects, with multi-nodular tumors, giving rise to alarming hæmorrhage, the appendages should be removed when practicable as an alternative for extirpation. But the latter operation should be done whenever the character of the growth will permit of its removal by dangers less than those which would be involved by its continuous existence.

3. To those tumors already recognized as demanding operation should be added those of uterine development that are liable to dangerous constriction by the uterine walls, and in which their destruction by this means might induce sepsis.

4. All cases of subserous growths, indolent yet progressive in character, in which the tumor has become a menace to neighboring organs, should, whether hæmorrhagic or not, be advised to exploratory incision with reference (1) to removal of the appendages, or (2) of the neoplastic organ.

5. All growing tumors, growing in women beyond the menopause, should be removed, if possible, by vaginal total extirpation, or, if that be impracticable, by abdominal section.

6. All distinctly operable cases demanding interference should be advised to submit to operation at the earliest practicable moment.

THE ETIOLOGY AND TREATMENT OF GRANULAR CONJUNCTIVITIS.

This was the title of a paper contributed by Dr. Francis Dowling, of Cincinnati, Ohio.

Dr. Dowling stated that the great rôle which the disease plays in the causation of blindness renders its successful treatment one of the great desiderata of our day. Its great hot-beds are in some of the countries of the Orient, owing to the prevalence of whirlwinds of sand and the intense heat and glare of the sun. The malady attacks by preference the poorer classes; the rich and well fed enjoy a comparative immunity from the disease. It is most frequent in persons between the ages of 15 and 45, and children under 6 rarely have the disease. It does not become epidemic at a height of over 250 meters above the sea level, and it loses its contagious character at this height.

Treatment.—Personally, he had had more success by touching the lids with the mitigated stick of ergent. nit., and then immediately washing it off, than with any other remedy. He applied the treatment usually twice a week, and on the intervening days he rubs in an ointment composed of yellow oxide of mercury and atropia. He also corrects any trouble of refraction that may exist, for unless this is attended to, the disease will persist under all kinds of treatment.

The disease is now treated in Paris, France, by completely everting the lid, and scarifying the granular tissue, then rubbing in with a stiff brush a $\frac{1}{500}$ solution of bichloride of mercury. Cases are cured in this way in four to six weeks, that formerly took several years to cure with the old treatment. In outbreaks of the disease in orphan asylums, barracks, etc., the afflicted should be completely isolated from the healthy inmates, and their apartments should be kept absolutely clean, and fumigated with burning sulphur at least once a week.

Dr. John Bartlett, of Chicago, presented a paper in the form of a

REVIEW OF AN OBSTETRICAL WORK,

published in Paris in 1682 by Paul Portal. He said the older members of the profession had for years rested in the opinion that it was Paul Portal to whom obstetrical science was indebted for the discovery of the fact, that in placenta prævia the after-burden was attached to the womb, and had not simply fallen down over it, as was taught by writers before his day.

Dr. G. Frank Lydston, of Chicago, followed with a paper entitled

OBSERVATIONS ON URETHRAL STRICTURE,

in which there were many striking points. The author opposed the general impression prevalent among surgeons that the long duration rather than the severity of a virulent urethritis determined the development of organic stricture. He claimed that this view has been due to fallacious reasoning from the standard of *post hoc ergo propter hoc*. It is not the long continued urethritis that produces a deposition of the adventitious tissue constituting organic stricture. On the contrary, a chronic localized urethritis exists because the stricture or the foundation of it has been determined at some portion of the urethra by the primary virulent inflammation. He claimed that the liability to the formation of organic stricture is directly proportionate to the severity of the primary inflammation. The localization of stricture, the author claimed, was not due, as Sir Henry Thompson and his school assert, to an obstruction to drainage and the retention of the products of virulent inflammation, but to deficient elasticity or distensibility of the canal at certain points. The conditions determining

stricture he compared to those prevailing in a rubber tube about which cords are tied in such a manner that while some actually constrict the tube, others simply prevent its distension. If fluid be pumped through a rubber tube thus constricted or restricted, as the case may be, at a certain degree hydrostatic pressure, and at certain intervals, friction, occurs at these points and a continual unrest. The epithelium is rapidly removed, its vitality being impaired by the virulent poison of urethritis. By and by rapid removal and reformation of epithelium becomes a cell habit, the resulting formation of cells being of a low grade of inherent vitality. In addition to this change upon the surface of the mucous membrane there is deposited young connective tissue cells in and about the affected point as an evidence of an attempt on the part of Nature to secure rest and prevent strain. These cells the author likened to sandbags thrown up to strengthen or prevent a breach, as the case may be, in a fortification.

The doctor called attention to a number of interesting reflex phenomena incidental to stricture of the urethra. He also went exhaustively into the various toxæmia conditions incidental to renal disturbance secondary to stricture, and to that peculiar form of toxæmic incident to the absorption of ptomaines from the site of the urethral lesion. He went into the subject of electrolysis and absolutely denied the possibility within the limits of safety of using it in the treatment of organic stricture. Galvanism, he claimed, instead of electrolysis, is what is really accomplished. He condemned the routine and extreme claims of Newman, and also the other extreme as represented by Dr. Keyes, who asserts that galvanism, *i. e.*, so-called electrolysis, has absolutely no effect. Dr. Lydston claimed that the effect of galvanism upon organic stricture of the urethra was the same in its physiological character as upon healthy or morbid tissue in any other situation. The author described what he terms *plus* conditions of organic stricture. Thus we have engrafted upon the organic foundation varying degrees of hyperæmia, spasm, and œdema, one or all. These *plus* conditions, the author claimed, galvanism, properly applied, would subtract from the organic condition in certain cases, and in so far as this effect was marked the stricture would be benefited. The author denied the possibility of the galvanic current producing absorption of fibro-connective tissue after it has arrived at the acme of differentiation by any current which will not destroy the mucous membrane itself; in other words, we cannot control the galvanic current so that it will exert a selective action and remove the abnormal tissue while sparing the normal tissue.

The following officers were elected:

President—Dr. C. A. L. Reed, Cincinnati, Ohio.

First Vice-President—Dr. C. S. Bond, Richmond, Ind.

Second Vice-President—Dr. Thomas Hunt Stucky, Louisville, Ky.

Secretary—Dr. E. S. McKee, Cincinnati, Ohio.

Chairman of the Committee of Arrangements

—Dr. Joseph Ransohoff, Cincinnati, Ohio.

Place of next meeting, Cincinnati, October, 1892.

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

In the possession of some descendants of John Murray, who was treasurer of the New York Hospital, nearly a hundred years ago, there are some very interesting reports of that venerable institution in its early days which our correspondent has lately had the opportunity of examining. These reports, or rather circulars of information, which are naturally yellow with age, but in an excellent condition of preservation, are printed on a single sheet of four quarto pages. The first of them commences as follows:

O. I. CHARITY EXTENDED TO ALL. STATE OF THE NEW YORK HOSPITAL, FOR THE YEAR 1797.

Below this is a wood-cut of the hospital building on lower Broadway, the front of which was about 125 feet in length. Then comes a list of the officers and governors, and this is followed by the names of the medical staff, and the descendants of some of whom are still prominent in the profession of this city. The physicians were John B. Rodgers, Elihu H. Smith, Samuel L. Mitchell and David Hosack, and the surgeons, Wright Post, Richard Kissam, Samuel Borrowe, Richard Bayley and Valence Seaman. The house-surgeon was Dr. Samuel Barlow, and the steward rejoiced in the name of William Dogsflesh. The names of the apothecary and matron are also appended.

The circular goes on to state that this institution was undertaken by private subscription of the inhabitants of New York, in the year 1770, and in consequence of a petition to the then governor by Peter Middleton, John Jones and Samuel Bard, three reputable physicians of this city, was incorporated by charter on the 13th of the 6th month (June), 1771, under the style and title of the Society of the Hospital in the city of New York, in America." A few extracts from the early history of the hospital as given in this report may prove of interest:

Animated by the Principle of christianity, the Society uniformly disclaimed any influence of contracted attachment to any national, civil or religious Distinctions; that all Persons should be entitled to the Benefits of the Institution, whose Maladies and extreme Indigence placed them on the Charity of others for Relief. By the influence of Doctor Fothergill and Sir William Duncan was aided by the Contributions of many Inhabitants of London and other Parts of Great Britain; the Legisla-

ture also aided the Institution by an Allowance of Eight Hundred Pounds annually, for Twenty Years, and a Plan of a Building, suggested by Dr. John Jones, was agreed upon in 1773, but unfortunately when the House was almost completed, it accidentally took fire on the 28th of the second month (February), 1775, and was nearly destroyed. By this Calamity the Society sustained a loss of Seven Thousand Pounds, and their Intention would perhaps have been suspended, had not the Legislature almost immediately voted them the sum of Four Thousand Pounds to assist in repairing their loss and rebuilding the House; but the War with Great Britain, which took place in the same year, prevented its completion; and during the War the House was occupied by Barracks, and much injured by the British Garrison. Owing to a Variety of Obstacles, and the Derangement in the Circumstances of our Citizens during the War, it was not until the first month (January), 1791, that the House was in proper order to receive Patients; at which Time a Number were received. The Annuity granted previous to the War by the Provincial Legislature having ceased with the Commencement of Hostilities, except an Allowance for Four Years of that Annuity, which was paid the Society out of the Excise since the Peace, the Legislature in 1792 granted Two Thousand Pounds a Year, for Five Years, as a Consideration of Arrears due, for its better Support. In the Second Month (February), 1793, the Act for allowing Two Thousand Pounds was repealed, and the Sum of Four Thousand Pounds was granted for Five Years annually, and in the second month (February), 1796, this was increased by adding the further Sum of One Thousand Pounds per annum, for Four Years. By an Act of the Legislature, passed 1st of the fourth month (April), 1796, entitled, 'An Act more effectually to regulate the Port of New York,' the Harbour-Master is directed to pay to the Hospital certain fines therein mentioned."

"Notwithstanding all these generous allowances," the report goes on to say, "the Governors have not been able to complete the necessary Arrangements, owing to certain alterations, repairs and improvements that had to be made about the buildings and grounds." We read next that persons laboring under incurable decrepitude, or long continued ailments of any kind, were considered as fitter objects for an almshouse than for this hospital, "which is properly an Infirmary, for the Reception of such Persons as require 1st, Medical Treatment. II. Chirurgical Management. III. Maniacs, and IVth. It is in Contemplation to fit up a Laying-in Ward, for the Reception and Accommodation of poor and distressed pregnant Women, so soon as Circumstances shall permit."

That the value of such an institution as a school for clinical instruction, and the necessity for a good medical library, was appreciated at this early date, is shown by the following extract: "The Students who attend the Lectures of the Medical Professors of Columbia College likewise attend regularly the Practise of the Hospital, which has thus become a valuable Addition to the excellent Medical Establishment of that Seminary; the Benefit derived from Attendance on the Cases of the Sick is

very much promoted by the Clinical Lectures delivered on the more select Objects of Practise by Dr. Rodgers, whom the Medical Faculty of the College have appointed to that Employ. And that the Interest of Letters and Science might be as much attended to as possible, the Governors have voted the sum of Two Hundred Pounds as the Beginning of a Library, to be composed of Books on Medical and Chirurgical Subjects, and on such Philosophical and Economical Matters, as have a Connection therewith, so that the Governors themselves, as well as the Physicians and Surgeons of the Hospital, may have the best of information on all needful Occasions, and the means of acquiring Knowledge be greatly facilitated to Students of Physic and Surgery." From this it will also be seen that the recent consolidation of the College of Physicians and Surgeons with Columbia College, is only a return to the condition of affairs existing in the good old times a hundred years ago. It is interesting also to read the record of the actual starting of the great New York Hospital Library, which has since become so famous all over the medical world: "By the Care and Pains of Doctors Mitchell and Smith, the Purchasing Committee, a very select and valuable Collection of Books have already been made; and, it is earnestly to be hoped, the Funds of the Corporation will be found commensurate to the annual Appropriation of a Sum of Money for this valuable Purpose."

On the third page of the report is given an abstract of the financial accounts of the hospital for the current year, and on the fourth page a summary of the medical and surgical cases. During the year 1797, the total number of patients treated was 578, of whom 240 were natives of America and the rest of foreign birth. The largest number of cases of any one disease is set down to syphilis, viz.: 127. Third on the list as regards numbers comes pneumonia. Of this disease there were 59 cases, of which 24 were cured, 2 were discharged by desire, 13 died, and 20 still remained under treatment at the end of the year. Only six cases of phthisis were noted. Of course, the name typhoid does not appear on the list, but we find eight cases of typhus, of which two died. The diagnosis of "tumor," without designation as to the seat or character of the growth, is given in three cases. There were two cases of cancer, of which one is marked cured and one relieved.

From the report for 1800 we find that the number of patients treated had almost doubled during the three years, the total during that year being 1103. Of these, no less than 306 had syphilis. This year there were but 20 cases of pneumonia. In addition to 10 cases of *fever and ague*, 16 cases of *intermittent fever*, and 2 cases of *remittent fever*, we find 43 cases set down simply as "fever," without any indication of the nature of the fever. As the name typhus does not appear on this list, and as 12 of the patients died, it seems probable that these were for the most part cases of typhoid. On the list of diseases appear *anasarca*, 1 case; *ascites*, 2 cases; and *dropsy*, 10 cases. This year there were 15 cases of small-pox and 4 cases of measles.

P.B.P.

NECROLOGY.

DR. CHRISTOPHER JOHNSTON, of Baltimore, died October 11, in his 70th year. His family had been Baltimorean since 1766, and he was the third of his name. He was an alumnus of the University of Maryland in the year 1844. He was chosen to a chair in his *alma mater* in 1864, and built up a fine reputation as an artistic and instructive teacher, having great facility with pencil and brush. In 1870 he succeeded the late Nathan R. Smith to the much-coveted chair of surgery. For a decade at least, he was regarded as among the first in this branch; in his studies he showed a strong preference to microscopy and pathology. He was a frequent contributor to the Medico-Chirurgical Faculty of Maryland, being its president in 1876. He was a member of this Association from 1855.

DR. DAVID H. STORER, of Boston, died September 10, in his 88th year. He was one of the senior ex-presidents of the American Medical Association, having held the chair at the Baltimore convention in 1866. Dr. Storer was eminent as a scientist as well as a physician and medical teacher. A fuller biographical minute is in course of preparation and may be expected in an early issue.

DR. THOMAS T. PRATT, who died at the University Hospital, London, August 29, was an Alabaman by birth, who had resided abroad almost continuously since the close of the civil war. He was a son-in-law of the late Professor Marion Sims, and built up a large practice in Paris. During the last fifteen years he had resided in London. He served with distinction in the Franco-Prussian war, and obtained crosses or decorations from both nations after the war was over.

MISCELLANY.

"The Lancet" on American versus European Medical Education.

We have more than once directed the attention of our readers to the state of medical education and of the medical colleges in the United States, and to the regulations of the schools and licensing boards of the profession. It requires but a slight acquaintance with the members of the profession in America who visit us, and with American literature and journalism, to see that there must be many sources of good medical education in the States. We are apt perhaps to be somewhat prejudiced by the newspaper accounts which reach us of fraudulent colleges and bogus degrees, and the facilities for their existence and prosperity in the very constitution and law of the States are unfortunately too great. If we refer to them, it is in no unfriendly spirit to our brethren in America. On the contrary, our exposure of them is supplementary to their own efforts in that direction. There is in the States, as we have frequently pointed out, a wide and earnest attempt to expose and remove the defects of their system and to lift the whole standard of medical education to a European level.

We have before us a very interesting paper by Samuel O. L. Potter, A.M., M.D. (Jeff.), Professor of the Princi

ples and Practice of Medicine in the Cooper College of San Francisco, read before the forty-first annual meeting of the American Medical Association. The paper, which is headed American *versus* European Medical Education, after comparing American medical college work with that of European medical schools, seems to be an honest endeavor to demonstrate that the result is by no means so unfavorable to the American schools as is generally assumed. Dr. Potter is very indignant at what he calls the feeling of contempt for American medical education and persons, which, he says, so "pervades the European that, polite as he is, he is never able wholly to disguise it." He is especially angry with the action of the authorities of the medical school at Berlin in denying to American graduates studying there the right to the letters M.D. after their names. And he suggests as punishment that American students should withdraw from Germany, and for post-graduate study visit London or Edinburgh, where he thinks they will benefit more directly than in Berlin or Vienna. But he goes further and suggests retaliatory legislation refusing recognition to foreign graduates until the American diplomas are recognized.

We sympathize with Dr. Potter and all other earnest colleagues of his who are doing their best to put medical education on a proper footing throughout the States, and who are conscious of the disrespect which, meant for the worst American diplomas, is very apt to affect the best of them. But we venture to suggest that he will attain his object sooner and better represent the just dignity of medical teaching authorities in the United States by a little fuller admission of the difference between the process of medical education in the States and in European countries, and a little longer perseverance in the efforts which he and the representatives of other American schools are making to lessen that difference, which is practically admitted by himself. It is not only in details, but in the absence of a central controlling power in the States. In European countries the State acts from a center and as a whole. In England, in addition to the central legislature unifying medical laws for England, Ireland, and Scotland, there is the General Medical Council, controlling and supervising all the medical examining boards. Dr. Potter speaks kindly of England, and naturally looks to her for recognition. We cordially reciprocate the sentiment that the great English-speaking nations should in this, as in all matters, honor and respect each other. But he will take it well from us when we confess that he has not established to our satisfaction that the American is equal to the European curriculum.

In respect of the *time* required for medical education in England and the States, respectively, we can not follow him when he tells us that, inasmuch as the conjoint medical colleges of England allow a *year and a half* of the four years' time they require to be spent in receiving instruction as a pupil of a legally qualified practitioner, thus leaving only two years and a half for school and hospital work, they do not so favorably differ from the American colleges, which always require a year's pupilage previously to their two or three years' college work. We do not find such a permission in our reading of the regulations of the English colleges. They specifically require "that not less than three winter and two summer sessions shall have been passed at one or more of the medical schools recognized by the two colleges." We know as a matter of fact that men can only enter the profession after a preliminary examination, and that from whatever board, university or college students in England take their qualification, they have to work four years for it in consecutive sessions, and to pass very trying examinations before they succeed. Moreover, we would remind Dr. Potter that the General Medical Council has this year decided that the term of medical education must extend over *five* years, and has not sanctioned the use of more than six months of this time in the way of pupilage. We have said that the exposure of the de-

fects and faults of American medical schools and boards is the work of American physicians and surgeons who are jealous of the honor of their profession, and who, in many instances, as Dr. Potter says of the president and founder of the Cooper Medical College, of San Francisco, have made great sacrifices for it. He avers "that each member of his college gives ten hours a week to college work, exclusive of the hours spent in preparation, and not one draws a cent from its treasury." This is very noble, but it has no bearing on those scores of colleges which swarm in the States, whose diplomas are given after two or three years' study, and with little or no preliminary education. If any one doubts the evil, let him invest in one of the most instructive medical publications in the world, The Report on Medical Education of the Illinois Board of Health—one of the States which is blessed with a legislature that has given, as all States should give, to a medical board the power of judging diplomas, and refusing recognition to unworthy ones. This report abounds in information as to the conditions of medical education in the United States and Canada, and its able compiler, Dr. Rauch, can have no interest in misrepresenting the facts. He points out that in the seven years reported on there has been very great improvement. There has been a steady rise in the number of colleges requiring proofs of preliminary education, and of colleges requiring a more extended period of medical education. There is a yearly decrease in the percentage of graduation to matriculation in the United States. Another feature of the American case is the existence of examining and licensing bodies which do not give instruction. These are all marks of an improvement which is bound to go on as public and professional opinion on the subject is strengthened. The effect of the Illinois State Board raising the minimum requirement for diplomas to be recognized in that important State was to diminish considerably the number of students and of graduates. It is inevitable that when men can get diplomas on easy terms elsewhere, they will not repair willingly to those boards which exact higher terms. The great hindrances to progress in the States are the inequality of requirement and the number of schools and degree-granting bodies without central law or control. There are still 135 medical colleges of all kinds in the United States. Each State has its own medical bodies, and the powers of these vary in each State. In some, as in Illinois, there is an act of the State empowering a medical board to grant medical qualifications. In others there is no law on the subject. In a great many States diplomas are merely registered in a county clerk's office. In others bodies seem to form and to dissolve again, or to merge into other bodies with functions of a teaching or diploma-granting kind in a most remarkable way. One has only to study the history of the schools, even of a leading State, to see how much too easy it is for schools to be formed. In the State of Pennsylvania, for example, where the medical faculty dates back to Franklin's time, and was chartered mainly by his influence, sixteen schools of various kinds could until lately be counted. Nine of these, fortunately, are extinct, some having been guilty of fraud of the worst kind. These are the evils incidental to a system of government by separate States. We rejoice at the efforts made to mitigate and remove them, and wish such endeavors all success. But it is obvious that such a loose system, and one so open to abuse, exists nowhere in Europe.—*London Lancet*, Oct. 3, 1891.

THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.—Programme of the Fourth Annual Meeting, to be held in the hall of the House of Delegates, Richmond, Va., on November 10, 11 and 12, 1891. Members of the medical profession are cordially invited to attend. First day, Tuesday, November 10. Morning session, 9.30 o'clock. Address of welcome and response.

1. Albuminuria: Its Relation to Surgical Operations, by J. W. Long, M.D., Randleman, N. C.
2. On Systemic Infection from Gonorrhœa, by Bedford Brown, M.D., Alexandria, Va.
3. The Neuroses of the Genito-Urinary System in the Male, by G. Frank Lydston, M.D., Chicago, Ill.
4. The Principle of Drainage as Applied to the Surgery of the Deep Urethra, by F. W. McRae, M.D., Atlanta, Ga.
5. A Report of Some Additional Cases of External Perineal Urethrotomy Without a Guide, by J. Edwin Michael, M.D., Baltimore, Md.
6. The Proper Method of Performing Circumcision, by W. Frank Glenn, M.D., Nashville, Tenn.
7. Reduction of Dislocations by Manipulation, by W. F. Westmoreland, M.D., Atlanta, Ga.
- Adjournment at 1 o'clock P.M.
- Afternoon session at 2.30 o'clock.
8. Drainage in Endometritis and Salpingitis, by W. M. Polk, M.D., New York, N. Y.
9. Complications in Pelvic Surgery, and How to Deal with Them, by Joseph Price, M.D., Philadelphia.
10. Laparotomies Performed During the Past Year, by Thomas Opie, M.D., Baltimore, Md.
11. A Case of Pelvic Abscess, by John Brownrigg, M.D., Columbus, Miss.
12. Ovarian Cysts, with the Report of a Case of Ovariectomy in a Young Girl, by C. Kollock, M.D., Cheraw, S. C.
13. Abdominal Section in a Case of Cyst of the Mesentery, with Remarks, by J. A. Goggans, M.D., Alexander City, Ala.
14. A New Method of Diagnosis in Disease of the Sigmoid Flexure, by Joseph M. Mathews, M.D., Louisville, Ky.
- Second day, Wednesday, November 11. Morning session, 9:30 o'clock.
15. A Medico-Legal Aspect to Pelvic Inflammation, by W. W. Potter, M.D., Buffalo, N. Y.
16. Medico-Legal Aspect of Intestinal Surgery, by J. D. S. Davis, M.D., Birmingham, Ala.
17. Peritonitis from a Surgical Standpoint, by A. V. L. Brokaw, M.D., St. Louis, Mo.
18. Hand Disinfection, by Howard A. Kelly, M.D., Baltimore, Md.
19. Cataphoric Treatment of Uterine Fibroids by Iodide and Other Agents, by Hunter McGuire, M.D., Richmond, Va.
20. The Pedicle in Hysterectomy; How Formed; Its Subsequent Behavior; Its Final Condition, by I. S. Stone, M.D., Washington, D. C.
21. Clinical Importance of Skin Dimpling in Carcinoma of the Female Mamma, by L. McLane Tiffany, M.D., Baltimore, Md.
22. Early Diagnosis of Carcinoma by the Microscope, by H. Berlin, M.D., Chattanooga, Tenn.
- Afternoon Session at 2:30 o'clock.
23. The President's Annual Address.
24. On Injuries to the Pelvic Floor and the Method of Repairing the Same, by Thomas Addis Emmet, M.D., New York.
25. The Part the Shoulders Play in Producing Laceration of the Perineum, with Suggestions for its Prevention, by W. D. Haggard, M.D., Nashville, Tenn.
26. The Surgical Treatment of Anterior Displacement of the Uterus, by C. A. L. Reed, M.D., Cincinnati, O.
27. The Growth of Fibroid Tumors of the Uterus after the Menopause, by Joseph Taber Johnson, M.D., Washington, D. C.
28. Thinness of Uterine Walls Simulating Extra-Uterine Pregnancy, by Geo. J. Engelmann, M.D., St. Louis, Mo.
- Third Day, Thursday, November 12. Morning Session, 9:30 o'clock.
29. Tracheotomy for Foreign Bodies, with Cases, by W. O. Roberts, M.D., Louisville, Ky.

30. A Method for Removing Impacted Gallstones by means of Solvents, by Robert T. Morris, M.D., New York.

31. Cholecystotomy—Report of Case—Fifty-two Gallstones and 10 Ounces of Pus Removed—Recovery, by W. B. Rodgers, M.D., Memphis, Tenn.

32. Treatment of Gallstones, with Report of Cases, by W. E. B. Davis, M.D., Birmingham, Ala.

33. Nephrectomy, with Report of Cases, by Edwin Ricketts, M.D., Cincinnati, O.

34. The Present Status of Cerebral Surgery, by Landon Carter Gray, M.D., New York.

35. The Treatment of Injuries of the Skull, by W. H. Hudson, M.D., LaFayette, Ala.

36. Some of the Complications of Psoas Abscess, by J. McFadden Gaston, M.D., Atlanta, Ga.

Afternoon Session, 2:30 o'clock.

37. Venomous Serpents of the United States, and the Treatment of Wounds Inflicted by them, by Paul B. Barringer, M.D., University of Virginia.

38. The Female Urethra, by K. P. Moore, M.D., Macon, Ga.

39. Bleorrhœa in Women, by J. T. Jelks, M.D., Hot Springs, Ark.

40. Hæmorrhage *versus* Shock, by W. L. Robinson, M.D., Danville, Va.

41. Imperforation of the Rectum, by Geo. Ben. Johnston, M.D., Richmond, Va.

42. Senile Gangrene, by Frank Prince, M.D., Bessemer, Ala.

43. A Case of Induced Abortion for Relief of Nausea and Vomiting, with Remarks, by Christopher Johnston, M.D., Richmond, Va.

Railroads: Those who attend the meeting must obtain from the ticket agent at the point of starting a certificate that they have paid full fare to Richmond. These certificates will be signed by the Secretary of the Association at Richmond, and upon his certificate a return ticket will be issued at one cent per mile.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from October 24, 1891, to October 31, 1891.

Capt. Charles Richard, Asst. Surgeon U. S. A., is relieved from duty at Ft. Logan, Col., and will report in person to the commandant of the Military Prison, Ft. Leavenworth, Kan., for duty.

Capt. Louis M. Maus, Asst. Surgeon U. S. A., relieved from duty at Whipple Bks., Ariz., and ordered to Ft. Apache, Ariz., for duty.

Capt. Victor C. Biart, Asst. Surgeon U. S. A., having been found incapacitated for active service on account of disability incident to the service, is, by direction of the President, retired from active service, to date October 21, 1891.

First Lieut. Robert R. Ball, Asst. Surgeon U. S. A., granted leave of absence for one month, with permission to apply for an extension of one month.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending October 31, 1891.

Surgeon Henry P. Harvey, ordered to receiving ship "St. Louis."

Surgeon James M. Flint, detached from Smithsonian Institution, and to the U. S. S. "Miantonomah."

Surgeon T. C. Heyl, detached from receiving ship "St. Louis," and wait orders.

Official List of Changes of Stations and Duties of Medical Officers of the U. S. Marine-Hospital Service, for the Two Weeks Ending October 24, 1891.

Surgeon George Purviance, upon completion of duties as chairman of examining board, to inspect Marine-Hospitals at St. Louis, Mo., Cairo, Ill., and Cincinnati, O. October 16, 1891.

Surgeon John Godfrey, to represent the Service at the meeting of the American Public Health Association. October 14, 1891. To inspect Marine-Hospital at Louisville, Ky. October 14, 1891.

P. A. Surgeon H. R. Carter, granted leave of absence for thirty days. October 17, 1891.

P. A. Surgeon W. J. Pettus, orders to Norfolk, Va., revoked; to proceed to Cape Charles Quarantine for temporary duty. October 14, 1891.

P. A. Surgeon J. J. Kinyoun, to represent the Service at the meeting of the American Public Health Association. October 17, 1891.

P. A. Surgeon T. B. Perry, to proceed to Norfolk, Va., for temporary duty. October 14, 1891.

Asst. Surgeon G. M. Guiteras, to proceed to Gulf Quarantine for duty. October 20, 1891.

Asst. Surgeon M. J. Rosenau, granted leave of absence for thirty days. October 24, 1891.

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No. 20.

ORIGINAL ARTICLES.

A CASE OF IDIOPATHIC SPINAL HÆMORRHAGE.

Read before the Section of Medical Jurisprudence and Neurology, at the Forty-second Annual Meeting of the American Medical Association, Washington, D. C., May 6, 1891.

BY THEODORE DILLER, M.D.,

FELLOW OF THE PITTSBURGH ACADEMY OF MEDICINE.

Hæmorrhage into the spinal cord of traumatic origin, while not of very frequent occurrence, has been noted often enough to establish the fact of its occurrence beyond a doubt. But as to whether hæmorrhage into or about the cord may take place without an antecedent traumatism some writers are in doubt. However, the majority of writers do admit that idiopathic spinal apoplexy may occur, but they are all in accord in stating that the affection occurs only very rarely.

In view of these facts I trust the case I am about to relate will prove to be of some value as tending to place the existence of the disease beyond the peradventure of a doubt.

Although the case is incomplete inasmuch as no post-mortem record is included, yet I believe the clinical history alone will be sufficient to establish the diagnosis.

T. K., a laborer aged 51 years, had been in robust health and worked steadily up to the date of present illness. He is a tall man of rugged frame; habits of life good; never had syphilis nor any prolonged illness; heart normal.

March 12, 1891, after performing his ordinary day's work he went to bed feeling as well as usual. But instead of going to sleep in a few minutes as had been his habit, he remained awake, turning about the bed uneasily until 11 o'clock, when he was suddenly seized with an excruciating pain at about the first lumbar vertebra, which radiated from thence around the abdomen and down the thighs. He at once rose from bed in the intensity of his agony and rapidly walked up and down the room. After a few minutes he sat down upon the edge of the bed and bathed his feet in hot water which his wife had brought for him. While thus engaged, he became nauseated and attempted to vomit several times but did not succeed. The gastric distress

lasted only a few minutes. While his feet were yet in the water he noticed that they were becoming "numb," and told his wife about it. Upon attempting to stand up, soon afterwards, he became conscious of a diminution of power in his legs. He became greatly alarmed at this discovery and at once got into bed, and became aware, a few moments later, of the entire loss of motion and sensation in both legs. The pain rapidly lessened in intensity so that he was entirely free from it twenty-five minutes after the initial attack. The patient feels sure that his consciousness, his memory for words and ability to utter them, was never lost or even impaired during the attack. Members of his family bear him out in this statement. They are further in accord in stating that at no time was the motion or sensation in any of the organs above the umbilicus impaired. The loss of voluntary control of the bladder and bowels was noticed the next day and must have occurred coincidentally with the paraplegia.

A critical examination the next day revealed the following conditions: Paralysis of motion complete in both legs; power in the abdominal muscles greatly impaired; anæsthesia of all kinds completely lost in both legs, impaired over lower half of abdomen. Patient is unable to expel urine or fæces; was not aware that both bladder and bowels needed emptying. No impairment of mental functions; no pain; motion and sensation in muscles of upper half of body unimpaired.

Subsequent history.—Pain never returned, save for an occasional twinge. Urine and fæces taken away regularly by mechanical means. The paralysis as described continued unchanged until about April 4 (three weeks after initial symptom) when the first signs of the return of muscular power were noted. Patient could at that time move toes of left foot. From this time up to the present date (May 1) there has been steady progress towards recovery. He can now move both legs about the bed, flex knees and thighs. Sensation has largely returned. He is not yet able to expel his urine and fæces, although the desire to micturate and defecate now comes to him.

Remarks.—The very sudden onset of the symptoms would preclude the possibility of the trouble being due to tumor, aneurism, bone disease

or myelitis. An embolus would produce sudden symptoms, but it would be highly improbable that trouble of this kind could cause such a complete condition of paraplegia in less than half an hour. So I am forced to conclude that the lesion was a hæmorrhage—and a large one—either in the cord itself or in the structure immediately surrounding it. I am inclined to think the hæmorrhage occurred in the cord itself. As to the part of the cord involved, the symptoms would indicate the lower part of the dorsal region.

THE DIAGNOSIS OF TRAUMATIC LESIONS IN THE CEREBRO-SPINAL AXIS AND THE DETECTION OF MALINGERING REFERRED TO THIS CENTRE.

BY B. A. WATSON, A.M., M.D.,

CONSULTING SURGEON TO THE BAYONNE HOSPITAL, SURGEON TO THE JERSEY CITY HOSPITAL, ETC., JERSEY CITY, N. J.

The counterfeit can not be detected without an accurate knowledge of the genuine, and in addition to this an exact knowledge of the counterfeit, and likewise a definite knowledge of the difference between the genuine and counterfeit, is still imperatively required.

It therefore follows that he who would attempt to detect malingering should always be able to diagnose concussion of the brain and spinal cord. The proper performance of this task requires a full knowledge of the etiology, semeiology and pathology of the morbid condition under consideration. Let us, therefore, direct our attention to these essential factors of diagnosis—carefully analyzing each—in order that we may more thoroughly comprehend their relation and bearing on each other. It is universally admitted that concussion of the spinal cord most commonly follows falls upon the feet, buttocks, less frequently on the hands when both arms are outstretched, gun-shot wounds involving portions of the spinal column, a stroke of lightning, heavy blows delivered over the bones of the pelvis or in the line of the spinal column, etc. The direct effect of these falls and blows is the production of contusions of the soft parts, etc., which are more or less disorganized by these traumatic agents. The force of these agents is not by any means entirely expended in the production of these contusions, but there will be carried along the bony structure a vibratory motion which will also be imparted in varying degrees to the adjacent soft parts. A very fair idea may be gained of these vibratory movements by placing the hand on the apex of a bell, suspended in the air, while its base is struck with a metallic hammer; or by the touch of a properly keyed string of a musical

instrument when it has been put in motion. The same vibratory motion may be likewise very well illustrated by tapping gently with the finger on a glass jar or other vessel which is partially filled with jelly, and then watching the tremulous movements imparted to the contents by the slight blows delivered on the vessel. The attention of the medical profession has been very frequently called to the peculiarities of concussive or vibratory force by French authors, but its physiological and pathological action has never received that careful study to which it is entitled. A very important factor, which presents itself for our consideration in connection with study of this force is, the fact that it is not transmitted equally well by the various organs and tissues of animal bodies; and, consequently, a direct blow delivered on one part of the body may be entirely negative or result in the production of very little vibratory action, while on another part of the organism the results will be very marked. Thus a blow delivered directly on the nates will give rise to the concussive force and be transmitted along the spinal column to the bony walls of the skull, and from this structure to the brain itself, which is in such close contact with these bones. A portion of the same force will likewise be expended in varying degrees on those organs which are in intimate contact with this line traversed by the traumatic agent. The functional disturbances and the pathological changes in the various organs will depend on the physiological functions, weight, texture, etc., of the parts involved, which need not be enumerated here. A blow delivered on the feet, while the lower extremities are extended, will be transmitted to the bones of the pelvis, and then along the spinal column. A somewhat similar result may possibly be produced by a fall on the hands when the arms are extended; however, the force of this blow will be much diminished by reason of the anatomical differences in the parts, particularly the less intimate connection between the bones of the arms and the spinal column, than that which exists between the bones of the lower extremities and this important highway for the transmission of concussive force. It should likewise be remembered that the more concentrated the direct traumatic force, *i. e.*, the smaller the area to which it is applied, the greater will be the amount of concussive force generated while the other factors remain unchanged. Thus a blow covering an area of four square inches delivered directly over any part of the spinal column will generate far more concussive force than it would if spread over the whole posterior region of the body. In fact, in the former case, if the blow was a severe one, functional derangements and pathological lesions might be rationally expected to follow from the concentrated nature of the concussive

force, but in the latter they will be looked for in vain. There is a very marked difference between the concussion in the case of gunshot wounds produced by musket or rifle balls, and that which follows heavy blows or falls—in the former the pathological changes are more circumscribed, while in the latter they may be considered general. Thus a musket ball having found lodgement in the vertebral column, which has in some degree impaired its outer surface without producing any lesion of the osseous tissues within the canal, the spinal cord will be frequently found in an ecchymotic state at a point approximating to the lesion in the spinal column. In connection with this subject, it may be further stated that no single blow,—however great its momentum—delivered on the anterior surface of the thorax or abdomen, could be rationally expected to produce concussion of the spinal cord, since its force would be almost entirely expended on the visceral organs within these cavities. The study of the effects of lightning, and likewise those of electrical currents of both a high and low degree of potency—possess for the surgeon, in connection with the consideration of concussive force, very great interest. The vibratory character of electrical currents is apparently identical with the other forms of concussive force; and, furthermore, it is readily demonstrable that the physiological action, functional disturbances and pathological changes likewise possess essentially the same characteristics. The fact has long been recognized by the ablest authorities that concussion is physiologically indicated by a nervous and circulatory excitation or depression. In accordance with this opinion Verneuil has given the following definition of concussion: "A series of phenomena more or less sudden followed by a mechanical disturbance of the anatomical elements, tissues and organs, characterized by a temporary excitation or a depression of the functions of the parts disturbed, and likewise producing anatomical changes which are generally observed in cases of functional activity or repose." Mechanical concussive force, like lightning strokes and electrical currents, may produce every possible degree of concussion, varying from the slightest functional disturbances, which pass off within a few seconds, to instantaneous death. Further similarity on the effects of these agents is shown by the fact that concussion and even death may be produced by rapidly repeated mechanical blows or a rapid succession of electrical strokes, while a single impulse would be scarcely sufficient to cause even temporary functional disturbance. The pugilist knows that the blows which will promptly render his antagonist unconscious should be delivered on his head. He therefore seizes the head of his enemy and delivers on it in rapid succession blow after blow until his object is accomplished. Experimentation on

animals has shown that concussion of the brain may be caused by slight taps delivered on the head in rapid succession with a hammer, etc.

In our consideration of the etiology of concussion of the cerebro-spinal axis we have said little in regard to its causation in the brain. It is probably understood, however, that those agencies which have already been mentioned are the important factors in its production in this organ as well as the other organs of the body. The same general laws pertaining to the etiology of this morbid condition are as applicable here, as elsewhere; consequently a blow delivered on the head will be more efficacious in the production of concussion of the brain than would be the concussive force had it been transmitted to this organ from some other part of the body. Furthermore, the weight of this organ and other anatomical peculiarities of the same, must receive due consideration. In this attempt to describe the symptoms of concussion in the cerebro-spinal axis, we immediately encounter a difficulty arising from the fact that the functions of the organs are materially different; and, consequently, the symptoms observed in connection with a traumatism in the spinal cord, will produce entirely different symptoms from those found when a similar lesion exists in the brain. The remedy for this difficulty is very simple, and only requires that the symptoms be separately noted as they pertain to lesions in the different organs. A much more serious obstacle is found in the combination of all sorts of injuries with those of *pure* concussion, especially those having their origin in fractures, dislocations, sprains, rupture and stretching of ligaments, particularly in the spinal column, and likewise with the concussion in one organ, the symptoms of which are erroneously attributed to this morbid condition in another. In illustration of the above mentioned error, I desire here to call attention to the fact, that hæmaturia is frequently mentioned as a symptom of concussion of the spine, while I have *conclusively shown* by my experiments on animals, that it bears no constant relation to lesion of the cord, but on the contrary, following concussive accidents, *indicates a concussion of the kidney*. Furthermore, visual changes are frequently attributed to concussion of the spine, while as a matter of fact, the lesions on which these changes depend are situated either in the brain or the eye. I am now prepared to assert that the greater part of the organs within the thorax and abdomen are equally as liable to suffer from concussive force as the brain itself; and likewise that concussive accidents are much more frequent in these visceral organs than in the spinal cord. This assertion is based on the fact, that these lesions are entirely analagous to those observed in the brain, merely requiring that the proper allowance be made in these organs for differences

in weight, texture, etc., factors which must be taken into consideration in connection with the study of the lesions of concussion in the brain and spinal cord. Furthermore, every true concussion takes its origin in the same peculiar force. Therefore, if it is desirable to speak of concussion of the brain, spinal cord, etc., why should it not be applied to the lungs, liver, kidneys, etc.? Would it not be absurd to speak of gunshot wounds of the brain and spinal cord, while the term is withheld from analagous lesions caused by the same peculiar force in other parts of the body? There has recently been made an attempt to employ the term "*nervous shock*" instead of concussion; but this departure possesses no advantage and has already caused much confusion. No attempt is here made to deny that certain portions of the nervous system participate in the concussion; although it is self-evident that the functional disturbance and pathological lesions are primarily developed in connection with the *circulatory system*. These preliminary comments are made in preference to any attempt at the mere enumeration of symptoms, which, in order to possess real value, must be fully stated and explained. It should likewise be remembered that there are different degrees of concussions, and these differences are indicated by a corresponding difference in symptoms.

It must now be apparent that the limits of this article compel me to economize space, so far as it can be done without defeating the object for which it was written. Permit me, therefore, once more to call attention to the fact, that concussion always produces either excitation or depression, *i. e.*, functional activity or repose. The former condition possesses practically little interest, if observed immediately after the application of the concussive force, since it is commonly of short duration, and does not require any attempt at treatment. However, there is another form of excitation occasionally observed in severe cases of concussion of the brain, which commonly makes its appearance from twelve to forty-eight hours after the receipt of the injury. This condition is indicated by a full pulse, flushed face, throbbing of the carotids, headache, dry and hot skin, photophobia, noises in the ears, and sometimes marked drowsiness. These symptoms point to the existence of cerebral hyperæmia, which is commonly of short duration; but in some cases it is the prelude to inflammation of the brain. In the severe cases of concussion of the brain or spinal cord, the prompt appearance of symptoms indicative of depression, commonly suggests the existence of organic lesion, rather than mere functional disturbances; while, as a general rule, the degree of danger is fairly expressed by the depression. It should, however, be remembered that the symptoms of depression, in order to possess any special value, must pertain especially to

the functions which are known to be performed by these organs. Therefore diminished consciousness, although the patient may be aroused sufficiently to answer questions, the pupils contracted or dilated, relaxation of the sphincters, a feeble and irregular pulse, shallow and sighing respirations, a cold, pale and clammy skin—point very clearly to the brain as the seat of the injury, when the symptoms have followed promptly after the application of concussive force. The symptoms following those recorded in the above belong to the reactionary period; the object of this paper does not require that they should be mentioned here. Concussion of the spinal cord is most commonly indicated by the appearance of paralytic symptoms, which frequently involve the lower extremities—especially the motor power, and likewise, in many cases, also the sensory. Therefore, in our experiments made on dogs, our attention was promptly directed to the movements of these animals immediately after the application of the concussive force.

The following facts possess an important bearing on the subject now under our consideration. In a recent summary made from my "Experimental Study of Lesions arising from Severe Concussion," I shall here venture to cite the following: "Paraplegia is a very important indication of a lesion of the spinal cord, and may have its origin either in a disease or traumatism. This morbid condition may be either complete or incomplete, and when due to disease, it is commonly slowly progressive; but if due to a traumatism, it is rapidly manifested, and soon reaches its fullest development. In support of this statement, examine the following facts: The whole number of cases in which pathological changes were found in the cerebro-spinal axis were fifty; the whole number of cases in which any indications of these lesions were observed during the life of these animals were thirty-three, while our record shows that in the last mentioned class there were twenty-three cases of paraplegia."

It will here be observed that there were ten cases in which there had been noted during the lifetime of these animals some indications of a traumatism, but which did not exhibit during that period paraplegic symptoms. It is also worthy of notice that in every instance these paraplegic symptoms were observed immediately after the application of the concussive force, and furthermore, that in all cases of complete paraplegia there was not a single case which subsequently improved. In the large majority of cases of incomplete paraplegia there was commonly some improvement observed during the first three days, but in a few instances the paraplegic symptoms became more marked during the first twenty-four hours; however, even these cases soon showed signs of improvement. It is not claimed

that even the immediate appearance of paralytic symptoms after the application of concussive force, in all cases establishes the existence of pathological lesions in the spinal cord. I am strongly impressed with the idea that an injury of the peripheral nerves may be followed by temporary and commonly local paralysis. A certain degree of importance should be attached to the existence of either anæsthesia or hyperæsthesia in all cases where lesions of the spinal cord are suspected. The existence or absence of pain in these cases—especially true concussion of the spinal cord—possesses very little interest for the diagnostician. In fact, the existence of pain and soreness ought probably to be looked on as having their origin in a contusion, sprain or wrench, involving the vertebral ligaments, muscles, etc., rather than indicating lesions of the cord. Having now presented a few of the characteristic symptoms of true concussion of the brain, and likewise of the spinal cord, I desire to add in this connection, that it is certainly very unfortunate for the science of surgery, that hitherto it has been the custom of nearly all authors, writing on what they have unfortunately designated as “concussion,” to group together half a dozen or more traumatic conditions, differing radically from each other in their *etiology, semeiology* and pathology. It requires no prophet to assert positively that so long as this grouping is continued there will be a want of clearness in all these articles—that theory will be frequently introduced in the place of scientific facts, that clinical observation will continue to mislead the profession, that good-natured authors, believing that all their predecessors in writing on this subject have told a little truth, will still further add to the existing confusion in their attempts at compounding these incompatible ideas. Let me ask what would be the inevitable result, if medical authors should group together under the unfortunate cognomen of “Smith’s disease” scarlatina, diphtheria, rubeola, roseola, variola, typhus fever, etc.? However, this combination is no more objectionable than that grouped under the name of “railway spine,” which is so frequently employed by many of our surgical authors even at the present time. However, the dawn of a new light may be approaching, since Dr. John A. Lidell, in writing on “Injuries of the Back, Including those of the Spinal Column, Spinal Membrane, and the Spinal Cord,” states that “the traumatic lesions of the back naturally arrange themselves in three groups, as follows:

1. Injuries of the integuments and muscles, or soft parts generally.
2. Injuries of the vertebral column.
3. Injuries of the spinal membranes, spinal cord and spinal nerves.¹

¹ The International Encyclopædia of Surgery, Vol. iv, p. 668. Edited by John Ashhurst, Jr., M.D. New York: Wm. Wood & Co. 1884.

It must be apparent to any one that this classification presents many important advantages over that which is so commonly employed. Another serious source of confusion has arisen from the fact, that the term concussion, in former times, was restricted in its application to the brain—although analagous pathological lesions were produced by the same force in nearly all the organs of the body.

Furthermore, concussion was badly defined by the old authors; since the term was used to indicate a condition induced by a more or less violent shaking of the brain, whereby serious symptoms were produced without lesions of the structures.

Recent experiments on animals and a careful study of this subject have entirely failed to support their statements in regard to the *non-existence* of lesions after concussive accidents in the brain and spinal cord. The results of my experiments were very conclusive in regard to the existence of these lesions. There were fifty cases in which pathological changes were observed in the cerebro-spinal axis, but only thirty-three of these cases showed any symptoms during life of injury of this centre; it will therefore be readily seen that in seventeen cases, although pathological lesions existed, they were not made apparent by symptoms which could be recognized on the animals. It is likewise important to state in this connection, that there was not a single case observed during all of our experiments in which we even suspected the existence of concussion of the cerebro spinal axis where we failed to discover pathological lesions by our subsequent examination—*post-mortem* or *microscopical*. These pathological lesions, in true concussions, are certainly unique in character and nearly or quite pathognomonic in their signification. The only lesions which bear semblance to the pathological changes of concussion, are those arising from contusions, and these are localized, and not distributed generally throughout the organ, which is commonly the case in the former morbid condition. However, there is found an exception to these rules in the case of concussion following gunshot wounds, in which the injury is commonly localized and resembles more or less closely the ecchymotic appearance arising from contusions. The functional disturbances and the pathological lesions are clearly shown in my experiments, to have had their origin in the vaso-motor system. In order to illustrate the pathological changes in the spinal cord which have been observed to follow in a mixed or complicated case of concussion of this organ, I will here cite the report of an autopsy, etc.,² made on the body of a coal-porter who died thirty-four hours after the accident.

² International Encyclopædia of Surgery, Vol. iv, p. 790 et seq. Edited by John Ashhurst, Jr., M.D., New York. Wm. Wood & Co. 1884.

Autopsy.—There was no external trace of injury. The membranes of the cord were healthy. The substance of the cord was contused opposite the fourth and fifth cervical vertebræ. On section, there was found ecchymosis of the posterior horns of gray matter on the left side, and of the adjacent part of the lateral and posterior columns. There were also limited spots of ecchymoses on the right side, one in the right posterior column, and one in the right anterior horn of gray matter. The gray substance generally was hyperæmic. On removing the spinal cord and membranes, nothing abnormal was discovered in the vertebræ until the posterior ligament had been dissected off, when it was seen that the body of the fourth was separated from that of the fifth, and the left articular process of the fourth had been chipped off. Dr. John A. Lidell, who reports this autopsy, comments on it as follows: "The essential features of this instructive case are as follows: 1. The cord substance was injured by concussion, and not by any displacement of the parts; 2. the injury was attended by a number of minute extravasations of blood (ecchymoses) in the gray substance; 3. there were anæsthesia and loss of motion in both lower extremities and in the left arm; 4. there was paralysis of the sphincter ani and sphincter vesicæ, which denoted that the reflex motor apparatus was also paralyzed; 5. the anæsthesia passed away in the course of some hours, the return of sensibility being noted first in the parts most distant from the injury; 6. hyperæsthesia appeared synchronously with the reaction from "shock," and steadily increased in severity; 7. hyperæmia of the gray substance was found as well as ecchymosis. It should be remarked that the hyperæsthesia was more severe in the right arm than elsewhere, and this part had not at any time been paralyzed." This case was reported by Dr. Lidell as a pure or uncomplicated one of spinal concussion, but I am compelled to question the correctness of the report in this particular, and direct attention to the ruptured ligament, which it seems to me may have permitted a partial dislocation to have taken place—with contusion of the cord—the vertebræ afterwards having been restored to their proper position by the natural resiliency of the parts. The symptoms of paralysis were certainly more marked than they are usually in cases of pure, uncomplicated concussion of the spinal cord. The following microscopical report conveys a very clear idea of the pathological lesions observed in our experiments on animals in the cerebro-spinal axis when there were no complications in this centre.³ "Brain intensely hyperæmic otherwise normal. Every portion of the cord intensely hyperæmic. There were

punctate hæmorrhages in the dorsal and cervical regions of the spinal cord, in both the anterior and posterior horns, also in the middle commissure." The striking analogy existing between the pathological lesions in cases of death caused by electricity and the other cases of concussion, may be probably better illustrated by giving a condensation of the report of the autopsy made by Dr. Carlos F. McDonald on the body of William Kemmler, after execution by electricity, since this examination has been more carefully detailed than any of the others. The others, however, entirely agree with McDonald's so far as given. McDonald's report is as follows: "Rigor mortis marked. On incising the skin over the sternum, the blood which escaped was unusually dark and fluid, remained so on exposure. Lungs: tardieu spots were noticed on the posterior border of the lower lobe of the left lung, so also in the middle lobe of the right lung. Heart: valves and substance normal, ventricles empty. Liver: blood from cut surface of dark crimson hue. Gall bladder: distended with bile. Spleen: normal. Kidneys: both markedly congested. Brain: *capillary hæmorrhages* were noted in the floor of the fourth ventricle, also in the third ventricle and the anterior portion of the lateral ventricle. The perivascular spaces seemed to be distended with serum and blood." Dr. Spizka's report of the preliminary microscopical examination is as follows: "The brain, spinal cord and peripheral nerves appeared strictly healthy in every part examined, except in the area corresponding to the discolored (anæmic through the contraction of the vascular channels) area of the Rolandic and pre-Rolandic regions, the ventricular surfaces, the pons and the medulla oblongata. The latter, which had been the seat of post-mortem preservation of temperature approaching that of the normal human body, were distinctly softer than the observer has ever been accustomed to find these parts in autopsies on persons of Kemmler's age and performed so soon after death. The hæmorrhagic spots in the fourth ventricle, which were strongly marked, were not accompanied by signs of parenchymatous rupture of large blood vessels. Hence they may be regarded as having the same significance as the "taches de tardieu" found on the surfaces of the organs, notably the heart and lungs. The peculiar softened vesicular zone of tissue underlying the outermost layer of the cerebral cortex is noteworthy, as "the destruction line" runs parallel to the free surface of the brain and does not dip with the sulci. Examination of the fresh specimen revealed the existence of vacuoles (probably gas bubbles) in the ganglion cells and in the parenchyma of the "destruction line." From the fact that no hæmorrhages had occurred in this softened area it is a just inference that it was produced after life had become entirely extinct, for the continuance of a

³ An Experimental Study of Lesions arising from Severe Concussion, p. 22 et seq. by B. A. Watson, M.D., Philadelphia, Pa. P. Blakiston, Son & Co. 1890.

blood circulation in a softened brain area is incompatible with the bloodless appearance, already noted, and the absence of capillary hæmorrhages in this very district while they were present in those remote from the site of the electrode."

In order to approach the consideration of *malinger*, it is necessary to devote some attention to the traumatic conditions which frequently complicate concussion in the cerebro-spinal axis, since the majority of authors still include these morbid conditions under the head of "spinal concussion," "railway spine," etc. Fractures and dislocations of the vertebræ require little attention, at the present time, since they are easily diagnosed. The only exception to this rule will be found in those cases where there is a complete absence of deformity, which may be the case where the fracture consists in chipping off a portion of the articular vertebral surface, etc., or in an incomplete dislocation of a vertebra, in which the natural resiliency of the ligaments and muscles has restored the symmetry of the parts. In these cases, it is thought that the careful and observing surgeon will not be compelled to remain long in doubt as to whether the patient before him is a malingerer, or suffering from a real traumatic injury; since the prompt appearance of objective symptoms will certainly be largely dependent on the locality of the injury, while their degree of severity will depend very much upon the extent and character of the traumatism. There now remains for our consideration in connection with this subject, contusions, sprains, twists and wrenches of the back, which are entitled to a more thorough analysis than can be given them in this article, on account of their medico-legal bearings, in litigated cases. The study of these morbid conditions, it should be remembered, will be greatly simplified by bearing in mind the fact that their symptoms, the primary and secondary effects, are entirely analogous to injuries of the same character in other parts of the body. It is claimed that the spinal column and the bones which connect directly with it, are provided with ninety-nine articulations. The symptoms which characterize the morbid conditions now under consideration are pain, swelling, tenderness under pressure and occasional ecchymoses. The existence of the symptoms will be limited to the area involved in the traumatism, while the degree of severity will depend on the intensity of the injuries. There may be likewise, in some cases, constitutional disturbances which will aid in establishing the existence of a morbid condition. The ecchymoses and swelling are objective symptoms, and consequently entitled to due consideration, while the pain, stiffness and tenderness under pressure may require confirmation. The verification of the patient's statements on these points, and

frequently on others—especially questions involving the existence of paralysis—might be definitely put at rest by the proper use of an anæsthetic, which ought to be frequently employed in medico-legal cases. The general surgeon no longer hesitates to employ this agent in his private and public practice for diagnostic purposes, and why should it not be thus employed for the purpose of securing justice in our courts?

Drunkenness and syncope may make the diagnosis more difficult in certain cases of concussive accidents, whether it be pure or complicated concussion; but these factors are of short duration, and therefore cannot continue long to embarrass the surgeon. Having presented our views on the chief factors involved in the diagnosis of the so-called "railway spine," therefore we are prepared to devote a few minutes to the malingerer. It is unfortunately too frequently the case that a surgeon commences his examination, in medico-legal contests, after *having fully formed an opinion*, or at least a bias or prejudice. This, in many cases—in fact, almost universally—arises from the want of an analytical mind, and likewise the want of any carefully arranged system of examination. These are very serious defects in the expert witness and, when fully demonstrated, should disqualify him to give testimony. There is another serious defect, frequently observed in the members of our profession, which sometimes has its origin in laziness, although occasionally in an inordinate greed—where the physician has been *accustomed all his life* to give an opinion to a patient without either an examination or thought. It will be perceived that I have not yet reached the case of the malingerer; but I have thus far merely paid my respects to those who aid and assist the malingerer. The malingerer is certainly entitled to a careful and thorough examination, and each surgeon employed in the case ought to proceed in his examination with the same degree of care and caution that the most conscientious chemist would exercise, when required to make a chemical analysis in the interest of justice. It therefore becomes highly important to learn the true history of the litigant, and likewise that of his father, mother, brothers and sisters. All these matters have a special bearing on the case. It will be readily admitted that any person who has established a good character for truthfulness and honesty ought not to be classed with a mere adventurer. In the examination of all the factors involved in these cases of so-called "railway spines," the fact should never be lost sight of that *correct scientific opinions can only be reached by a systematic, methodical and painstaking investigation*.

Let us here present a brief *résumé* of some of the points which have been more or less considered in this paper.

1. The term concussion, as used by those who

first employed it, was erroneously defined, and unfortunately restricted in its application to the brain. These errors had their origin in a deficient knowledge of the pathological lesions engendered by concussive force.

2. Concussion is a more or less violent shaking or agitation of various organs in the body, producing functional derangements dependent on vaso-motor changes and well-defined pathological lesions.

3. Concussion may be either general or special, general when several organs are involved at the same time, or special when the entire concussive force is expended on a single organ.

4. The symptoms arising from concussion will chiefly depend on the extent of the pathological lesions and the functions of the organs.

5. The frequency with which concussion will occur in any particular organ will depend on the point to which the concussive force is applied, the relative weight of the organ, the character of its texture, and the protection afforded by its anatomical surroundings.

6. The fifth statement supplies the explanation of the comparatively frequent occurrence of concussion of the brain, lungs, liver and kidneys to that of the spinal cord.

7. Concussion of the brain and spinal cord is always attended with immediate symptoms.

8. Concussion of the brain or spinal cord without immediate symptoms is a mere hypothesis—a myth—and has no real existence.

9. There is no pathognomonic symptom of concussion in any organ of the body; but a thorough, systematic, methodical examination by a skilled surgeon will secure a correct diagnosis.

Finally, I desire to reiterate the fifth conclusion expressed by Dr. Henry Hollingsworth Smith, in a paper which he read before the Surgical Section of the American Medical Association in 1889, which is as follows: "No physician should go into court and swear that a plaintiff has had a concussion of the spinal cord, or of its nerves, unless he has proved the disturbance of the normal functions of the cord, as shown in sensation or motion, or both, and that the symptoms appeared soon after the injury."

AN EARLY SYMPTOM OF WHOOPING-COUGH.—Dr. Huguin, of Tourteron, affirms (*Union Méd. du Nord-Est*), that photophobia with dilatation of the pupil is a useful diagnostic symptom of whooping-cough in the early stage, before the cough has become characteristic. He cites three cases in support of this position; two of the patients were children and one an adult, and in all of them the symptom referred to preceded any other manifestation of the disease.

A CONSIDERATION OF TRAUMATIC LESIONS OF THE SPINE RESULTING FROM RAILROAD AND OTHER INJURIES—THEIR ETIOLOGY, PATHOLOGY AND DIAGNOSIS.

Read before the Section of Medical Jurisprudence and Neurology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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Since the enormous extension of the railroad system—surface, submarine and elevated—wherein steam is utilized as a motor, the attention of surgeons and the profession has been attracted to certain special features, which commonly attend or subsequently follow accidents, sustained by individuals on cars in motion, on iron rails.

Many have maintained that injuries resulting from railway disasters, possess characteristic and positive lesions, which are peculiar to themselves, in symptomatology, pathology and termination. While, on the contrary, there are not a few, who take an opposite view and claim identity of analogy, between them and other disorganizations of tissue, in which the collision of heavy, moving bodies has been the direct cause, or in which similar physical agencies, but devoid of steam propulsion, have come into action.

In the meantime, as if to give stability and warrant to the former allegation, certain practitioners in different sections of the country have organized, and now the profession is threatened with another specialty; we have the Society of Railway Surgeons. We have in several of our large cities and railroad centers, hospitals owned and controlled by railway corporations, or the medical officers in the immediate employ of roads. These are maintained by the companies for the purpose of treating those of their employes injured while in their service. With those hospitals owned and controlled by individual surgeons or colleges, services are usually rendered by contract with the railroad corporations, much to their advantage; for while professional aid is procured at a minimum rate, the companies are also protected, in having their maimed or injured under such supervision, as will effectually guard against malingering; and, besides, should a civil suit arise, the surgeon is drafted into their service.

So far we have no special section at the meetings of the American Medical Association, for railway surgeons. Is it necessary to further subdivide the field of surgery? While all general surgeons are presumed to possess ample qualifications to serve their country in the field, in times of war, yet France, Germany and England have each, supplementary medical institutions to equip medical graduates for military duty

With our rapidly extending lines of railroads, which radiate and ramify in every direction, on which more than one hundred thousand men are employed and millions of travelers ride, we can easily apprehend that the number injured annually must be very large. Do their injuries or lesions differ in their dynamic essentials, their anatomical characters or pathological phenomena, from those sustained by other causes in civil life? Do those injuries occasioned by collisions on railroads or otherwise in connection with travel or employment on them, constitute a certain and separate category of features, which are characteristic and peculiar, with regard to their local destruction and ultimate termination, and demand for their successful treatment the superintendence of one of special skill and extended experience? I think the majority will answer in the negative.

ETIOLOGY OF SPINAL INJURIES ARISING FROM RAILWAY ACCIDENT AND OTHER CAUSES.

Conditions of the spine arising from trauma in a general way, may be resolved into two divisions, viz., those in which there are distinct and definite lesions, and those in which there are functional disturbances, without any visible alteration of structure. With the former chiefly are we concerned, on the present occasion.

It has been seen that many regard railroad injuries of every description as possessing characteristic features. Everyone, who has had any hospital service, into which are entered casualty cases from railroads, has noticed that the destruction of the soft parts is very much more than is seen from other injuries, so that when amputation becomes necessary, and we trim sparingly, in a few days after, the flaps are gangrenous and we must go further up; or if we secure primary union not infrequently we will see an insidious osteo-myelitis arising; requiring a later and more extensive section of bone. It is this class of cases, too, in which we all must often notice that fearful phenomenon, of which so much is seen and dreaded by military surgeons—secondary shock.

It is important, therefore, before we can make a rational study of this question, that we ask ourselves, what a serious railway accident really is, which should give it those fearful attributes of destruction, or why they should be more common now, than formerly.

In considering the physics of the study, we must have a correct notion of inertia, momentum, velocity, power, resistance, motion and direction. A body at rest, is struck by a flying missile, the penetrating power of which is in direct proportion to its initial velocity. In studying railway injuries, or rather those occasioned by collisions on railways, we will discover the same identical laws in effect, as in the case of a

flying missile, but the picture is reversed; the human being is then in a passive, inert state, wholly beyond his own control at the moment of collision.

In the practical flight of an express train down an inclined plane, that ponderous mass of metal, the engine, and the passenger coaches are literally shot through space. In this state of motion, in making a sharp curve, or otherwise, the wheels leaving the rails, this train and its human freight, are sent onward, until the initial motion imparted by the locomotive and by increased gravity, has spent itself on the parts, in a state of inertia at the instant of collision. What gives to railway rolling stock its great destructive properties are its weight and speed. The car trucks to support their burdens, with safety, must be heavily constructed; besides, the more weighty their wheels, the more regular and easy their motion. To supply the demands of travel for fast mail and freight transportation the moving rate of speed has been very greatly augmented, hence danger, in the event of an accident, is proportionally increased.

We have then, in the modern moving train, propelled by steam, two factors indispensable for force, viz., weight and speed, which are always brought to bear on the body, in cases of sudden and violent concussions, when it in whole or part, is crushed, stretched or twisted. In many respects there is no little analogy between the spine and a train of cars. We may suppose each vertebra a car; the interlying cartilage a buffer; the ligaments connecting links and the head, the massive machine. In the center of all the *medulla cereбрalis et spinalis*, the precious freight, the passengers.

Of all the traumatic lesions which have definite and presumptive pathological lesions, arising in consequence of railway accident, or other mishaps, there are none, which have given rise to so much investigation, study, experimentation and vehement controversy, as those arising from railway accident, and which occupy the cerebro-spinal axis.

Eric Erichsen was among the first who contributed anything in a methodical way on the subject of spinal lesions attributable to railway casualties. In America Dr. B. A. Watson, of New Jersey, conducted a very extended series of experiments on the lower animal (the dog) with a view of further clearing up mooted pathological questions and endeavoring to connect symptoms with pathological changes.

Since the appearance of Erichsen's lectures we have had such a pathological entity as the "railroad spine." For he taught that the clinical features, morbid anatomy and history of certain forms of spinal injury, caused by railway accident, were unique, definite and characteristic.¹

¹ Watson, An Experimental Study of Traumatic Lesion of the Spine

Watson, on the other hand, after his painstaking, laborious and exhaustive investigation, concluded, to quote his own language, that "concussive accidents never produce pathological changes in the spinal cord, except when great force has been applied to the spinal column, and these cases generally, if not always, are complicated with a fracture, rupture and stretching of the ligaments, or severe lesions in other parts of the body, which terminate quickly in death."

Erichsen ventured to affirm that neuroses of every phase and degree, from profound melancholia, dementia or paralysis, might arise, either immediately after the railway collision, or at a remote date. His observations are mainly limited to the elements of the cord and brain with the meninges, and he takes but little notice of the part which the enveloping tissue play, either in association or as independent factors. The muscles, tendons, ligaments, extravascular supply and peripheral nerves are wholly ignored, and he looks solely for pathological changes to support his theory in the medulla and meninges. Watson's experiments having been conducted on the dog dropped through a chute, we must compare the striking difference between them and man, with respect to their physical conformation and mental attitude, before we can properly estimate the clinical application of these experiments. In one the spine is nearly perpendicular, and we must not overlook the element of fear. In the other, the spine is horizontal and has four supports instead of two, besides psychological influence is wanting. Man's head is very heavy in proportion to his size. The quality and direction of concussive force possessing but little analogy with such as is inflicted in railway accidents, we cannot unqualifiedly apply those experiments in the lesions under consideration.

Although the views of both distinguished authorities here cited are widely divergent and antagonistic in many respects, though, strange as it may appear, in one direction, at least, they evidently agree, for neither appears to attach much, if any, importance to the direful consequences to the integrity of the spine, which may follow injury of the soft parts independent of implication of the cord itself. Neither author has been able to supply anything but very scant pathological data from post-mortem examination on the human body, where death has been directly or indirectly caused by spinal injury.

In this connection an effort will be made to demonstrate by anatomical analysis and pathological observation that, quite independent of alleged morbid states which are manifested by clinical symptoms, we may and frequently do find the motor functions of the spine temporarily impaired or lost by lesions which in no way directly implicate the cord itself.

To proceed intelligently with the separative

causative factors, we must have a clear comprehension of the varied structures which we have to deal with, their relations and functions. Among the laity, and even medical circles, sometimes a most confused notion would seem to prevail with regard to injuries in the rachidian region.

What is the spine? We will be told that so and so met with an accident and has seriously injured his "spine." Lay people have a vague but singularly correct impression, nevertheless, that when paralysis immediately follows injury, the "back is broken." With our profession, the general opinion of a serious injury of the spine always implies that the cord has participated in the lesion. Neither view is correct, for we may have complete paraplegia without a broken back, and vice versa. And we may too see individuals invalided for life when the great nerve cylinder and bony arches have entirely escaped.

The spinal column in man is maintained in the upright position by a powerful set of muscles, with an accessory set of stays, the numerous ligaments which, though permitting varied movements, firmly retain the vertebræ in position. Besides those osseous spurs given off by each vertebræ, serve as levers and are so intimately interlocked that even in the dead body they are detached from each other with difficulty.

If the vertebral column be denuded of its muscles and traction force is applied in opposite directions, the arches or transverse processes will give way often before the ligaments. As the dorsal vertebræ are firmly braced on either side by the ribs, the spine, in the event of a traumatism, will yield less in this situation, but as the lumbar region is reached lateral support is wanting, and on this the whole weight of the head and trunk is borne.

Speaking in a general way, we may say that among the manifold and varied purposes which the rachidian column serves, the most obvious and important are: 1. To form the posterior boundaries of four cavities, if we include the sacrum. 2. To support the head. 3. To carry all viscera and structures lying beneath the under surface of the cranium. 4. To provide lodgement and protection to the spinal cord.

Its weakest and most superficial segment is its most mobile; its middle the most fixed, and yet—to employ a paradox—is in constant motion, through costal action on either side. The lumbar region is the most powerful and is the center of flexion between the trunk and pelvis.

It may be well in this connection, while considering the powerful and complicated structure of the spine, to remember that that organ within the tubular canal, the cords, is but fifteen inches long and weighs but an ounce and a half; that it floats in a water bed that protects it from pressure and ordinary jars. The cervical or lumbar

segments, in the event of great and concentrated violence, permits of a distinct, lateral swaying motion, so that the momentum of force may be spent rather on the ligamentous, osseous or muscular parts, than be transmitted to the cord or brain.

Besides either extremities of the spinal column where force may be applied, either in the way of traction or compression, it may be also brought to bear from behind, or laterally. Violence, to reach the cord interiorly, must first encounter the viscera, or disorganize the spinous bodies, which would be impossible without immediate destruction to life.

Of the different regions, probably none can sustain a crush or fall with as much impunity as the dorsal. The osseous structures of the spine, here lie below the posterior costal curves and force is diffused through the elastic contents of the thorax, or one or more ribs are fractured. The same degree of violence inflicted on the cervical region, suddenly and unexpectedly, would have mortal consequences. But, when one has even a second's notice, he instinctively shortens his neck, obliterates it, as it were, by crowding it into the thorax, by raising his shoulders up to the ears, depressing the chin to the sternum and the occiput to the *vertebræ prominens*.

Accordingly, we find the lumbar region the most vulnerable; for we may regard the segment as the centre of a hinge joint, and, as might be expected, is oftenest found the part which suffers in these spinal injuries, from which a patient may, for a time, survive. But the lumbar segment has a powerful and compact development; hence, simple violence, to compromise its delicate contents, must be direct and great, so that, as Watson discovered in his unique experiments on the dog, the lesion of the cord often, in itself, is of but minor importance, in comparison to the rupture or laceration of an organ vital to life.

It would be rational to assume that, in the vast majority of cases in which force operated in the cervical or dorsal regions with sufficient concussion to fracture bone, death would seem an almost inevitable consequence. In eight cases which have come under my observation, in which the brunt was borne by the lumbar spine, six died, one in six hours, two in a week, and one lived three weeks. One recovered completely, and the other left the hospital, paraplegic. There was paralysis in all these cases in the beginning. Three of them were the result of railroad accident. In all the cases, the kidney sustained associate lesions.

As far as the etiology of traumatic spinal maladies goes, my experience is mainly in harmony with the views promulgated by Dr. B. A. Watson, of New Jersey, in his experimental work on the spine, viz.: that in traumatism of the spine, attended with paralysis, we will *always* find pathological lesions involving it, of a definite and positive description.

Prof. Erichsen, in his lecture on spinal concussion, details at considerable length a large number of cases, in which symptoms of paralysis at varying intervals after *railroad* accidents appeared. In some of these cases, there were complications of brain symptoms, with affections of the nerves of special sense. In many there were disorders of vision or hearing, melancholia, hallucinations, neuralgias, loss of memory, unsteady gait in walking, numbness and hyperæsthesia, and other ailments affecting the nutrition of the body.

In none of those cases were pathological changes present *which could be proven*, but it was assumed that anæmia of the cord existed, or that there were either chronic meningitis or myelitis.

Having seen myself a considerable number of cases of injury to the back, arising from railroad injuries, in none have I ever encountered these sequelæ. And, with proper deference to the distinguished author, yet I am convinced that his premises are unsound and untenable. And I am satisfied that his conclusions, though ingeniously constructed, will not meet with favor among those of extensive experience in the treatment of railroad injuries, or serious traumatism of the spine.

There are, however, other serious lesions which may attend injury of the spine, which have been described by no writer in modern times, except Olliver.¹ I refer to those which are limited to the peripheral nerves, muscles, tendons, ligaments, vessels or bone; which are attributable to strain, twist, pressure, laceration or contusion, and give rise to extravasation of blood, to inflammatory exudates, synovitis, periostitis, abscess, amyotrophic changes, myopathies, thrombosis, embolism, phlebitis, cellulitis or ankylosis, and which may and often do, in early childhood, or even in middle life, be the starting-point of various organic maladies.

Extrinsic spinal injuries are very common. The vascular system supplying and maintaining the nutrition of the cord; its coverings, the meninges; the rachidean structures, osseous, ligamentous and muscular, is peculiar in its arrangement, although in many respects it is similar to the cranio-cephalic, in that there is a free intercommunication between the peripheral and the deep vessels. Hence, the explanation how inflammatory conditions are propagated from the superincumbent cellular tissues to the synovial investment of the vertebral joints, or to the elements of the cord, when the process is in relation to the cervical region.

I have on three occasions met with cases of spinal meningitis, in which the primary injury was first borne on the nates, or over the shoulders. A case of this description I saw with Dr. W. B. Fisher two years ago, in the town of Yonkers, N. Y. The patient was a young lady who, while

¹ Traité Maladies des Spine, ed. 1, p. 207.

on roller skates, fell on her left nates and side. She was very sore, over the seat of injury, for two or three days, the parts being swollen and tender. Soothing applications were applied, and she was confined to bed.

As the fulness and pain commenced to subside over the gluteal region, she began to complain of "pins and needles" (formication) in the soles of her feet. This was followed by numbness, and on the seventh day after injury she was completely paraplegic. On the tenth day she died, of typical meningitis of the spinal cord.

My two other cases were seen in hospitals. In one, spinal meningitis developed six days after the patient was violently clubbed by a police officer. On the second day after his castigation, his mid-dorsal region was one mass of welts and bruises. The skin over the injured area was mottled, hard and lumpy. With him, paralysis was confined to the lower extremities, but there was much more convulsive spasm of the extremities than in the preceding. His case was remarkable with respect to its termination, as he recovered from the meningitis, so that he was able to leave the Workhouse Hospital, on crutches, *three months after injury*, the paralysis not having wholly disappeared. No doubt a thickening sclerosed condition of the neurilemma of the nerve roots lingered, which might account for the nerve symptoms.

In my third case, the patient was injured by being knocked down by a passing team. Two ribs were fractured, but she was able to get on her feet, and walk home without assistance.

She was brought to the hospital on the fourth day, with symptoms of incipient spinal meningitis. The disease made rapid progress, quickly extending into the cervical section. She died on the fourth day after admission into hospital.

On post-mortem examination we found, on the left side, the sixth and seventh ribs fractured, close to the transverse processes. A large, diffuse extravasate of blood was discovered under the long, broad bands of the serratus magnus muscle, and the connective tissue on the right side. In places, it was liquid, in others partly organized, but for a very considerable radius about, the tissues were deeply red-stained by the escaping hæmatin.

The tendinous and ligamentous structures in the vicinity of the sixth and seventh cervical vertebræ were softened and thickened. On entering the spinal canal, no hæmorrhage was met with. The dura mater was greatly distended with a turbid, flocculent serum. Between the arachnoid and pia mater, throughout the cervical area, as far as the atlas, a fibro-plastic exudate was seen, which insinuated itself along the horizontal septa into the lateral sulci of columns. The medullary substance of the cord was softened in the centre, and was everywhere dotted with minute ecchymoses.

Besides those lesions which involve the cord secondarily, and have reference to propagation of irritation or infection, through the nerves, vascular channels or lymphatics, we have another important group arising from muscle or ligament strain, from contusion of the peripheral nerves, which regulate movement and nutrition of all the overlying structures, from the integuments inwards, from hæmorrhage, cellulitis, periostitis, synovitis, arthritis, fatty degeneration of muscle, limitation of muscular action or ankylosis. The etiological factors in all the above were primarily concussive force, and conditions dependent on vital phenomena.

Sprains are commonly understood as trivial wrenches or twists of an articulation, attended with pain, swelling, and ecchymosis of the integuments. Authors give them little notice. But over-strain or violent sprain of a joint, or series of joints, attended with extravasation of blood into the articulation, with laceration of muscle or ligament, may be the starting-point of very grave organic changes, particularly in the young, or those inheriting a feeble constitution. In spinal injuries, chronic, multiple synovitis, periostitis, softening, wasting and atrophy of the muscles, with weakening, stretching or displacement of the ligaments, are a few of the sequelæ, in aggravated cases. I have met with a case, in which a violent twist at the ankle-joint originated a diffusive osteo-myelitis which ultimately necessitated amputation above the joint.

We may have, in one or more joints of the spinal column, the same precise pathological conditions as obtain in the extremity; but as the spinal articulations are all deeply lodged, they more often escape. And, if they should be the seat of sprain, it must, during life, be rather inferred than proven.

Nevertheless, when a person comes under our observation, who is injured in the back, who has a febrile pulse and a high temperature, with a local fulness and hardness over a localized area of the spine, but in whom sensation and motion are perfect, there can be no doubt as to superficial or extrinsic nature of the lesions.

The most frequent source of injury to the ligamentous and muscular structures, is by indirect force at either terminus of the column. The dorsal and lumbar regions suffer most from this form of violence. One falls from a considerable height, or is hurled a short distance, striking on his nates or hip. The spine is bent backwards, forwards, or laterally, the inertia of the head, shoulders and trunk is mostly spent on the lumbar vertebræ.

Not infrequently, however, serious strains are induced by concussive force coming from an opposite direction; as when one is precipitated in such a direction that the point of impact is on the shoulder and side of the head, when the whole

weight of the lower trunk and extremities impinges, with great momentum, on the upper mobile, lumbar segment. These accidents, involving only the extrinsic structures of the spine, then, well deserve a careful study, for it cannot be denied that, when of a severe nature, the original pristine strength of the spine is forever lost, and locomotion will be always thereafter difficult and painful. If they occur in a maiden, she can never properly fulfil the duties of matrimony with safety; nor, in fact, perform any sort of labor requiring considerable effort.

A consideration of those infirmities of the spine, exclusive of the neuroses of the cord, following spinal injuries, opens the way for a new line of study, which may be cultivated with great interest to the surgeon and practitioner, and advantage to the crippled.

I have met with a few cases of spinal injuries in adults in which there followed absolute and permanent impairment of power, while the cord remained free.

The first case I saw with Dr. Sheahan, of this city, in which the patient, a young woman, was suffering from the effects of a fall into a deep trench on a dark night. She thought she struck on her shoulder but was not positive. She was confined to bed for more than six months and was unable to sit in the upright position for more than a year. The lumbo-dorsal muscles were markedly atrophied on both sides and the spinous processes of the lumbar vertebræ projected out so that the tips could be easily counted. There was no neurotic condition of any description. Her infirmity was local and was confined to the muscular and ligamentous structures alone. She was, when I saw her, wearing a very heavy gypsum jacket. Without it she was almost powerless to move. Her general condition was good, with a fair muscular development. There had never been any question in this case, or the two others which will be recorded, as suits for damages. It is now two years since I saw her, and her physician writes me that though she makes a living with the needle, yet she is as weak and helpless in the back as ever.

The second case was also in a woman. She was nineteen years old, and was injured while descending the steps from an elevated railroad station. She was near the surface when she slipped and fell with great violence on her back. Being unable to stand or walk, she was conveyed home in an ambulance, where she lay in bed four months. She was now examined by the railroad surgeon, who was inclined to regard her troubles as trivial, inasmuch as there was no central implication of the cord. At this time she was admitted in the hospital. On examination in the lower lumbar region it was evident that an abscess was forming close to the inner border of the quadratus lumborum muscle. On freely

incising it a fistulous tract was discovered extending down to the transverse processes of the second and fourth lumbar vertebræ. By enlarging the wound, we came down on those processes of bone which were necrosed, and with the gougers cut them away. There was a considerable area of diseased tissues along the line of the sinus, which was scooped away. The incision healed by granulation, beginning at the bottom, but it was more than three months before it closed in entirely. She now occupies a position in a dry goods store, but there remains a rigidity of the muscles of the back, which greatly limits the normal stooping movement and prevents her from occupying her former position.

My third case of permanent impairment of function following severe injury of the back, was a carpenter, who while in a stooping position was struck over the lumbar region by a falling piece of timber. I saw him shortly after he was injured. There was no palsy, but his spine was rigidly fixed and over the seat of injury there was great pain. He passed blood in his urine, both as coagula and in the fluid state, in such quantities as to threaten fatal anæmia. By the aid of refrigerant drinks and cold applications on the nephritic regions it gradually lessened and in a few days completely ceased. This man had a slow and painful convalescence. For many months he could not maintain the trunk on the femoræ in sitting or walking, without making a lumbar support, and for three years he was an invalid. For a long time there was a marked and considerable fullness over the left kidney, whether attributable to hæmorrhage beneath the capsule into the parenchyma or stenosis of the ureter with hydronephrosis, we are unable to say. It, however, gradually diminished in size and ultimately disappeared.

These three cases constitute all the lesions of an extrinsic character clearly attributable to overstrain or contusion of the spine, in which permanent disability in varying degrees have followed injury, that I have seen.

In the treatises and brochures of Abercrombie, Guthrie, Brodie, Cooper, Ollivier, Chapponeare, Duplay and Richet many cases of this character are mentioned but not fully described.

In analyzing the phenomena of those painful neuroses over the long axis of the rachidian plane, we cannot forego at least a cursory examination of the nerve supply, of the meninges, the bony framework of support, the soft parts and integuments.

The dura-mater is supplied mainly by extremely delicate prolongations inward of the sympathetic through the intervertebral foramina, and by ganglionic fibres from the nerve roots which pierce the neuralemma, and are reflected inward and upward in opposite directions.

The deep osseous tissues, ligaments and cellu-

lar elements in the dorsal region, are provided by the posterior ramifications of primary division of the twelve dorsal nerves. The anterior branches of the six lower dorsal nerves supply the three sets of muscles which laterally wall in the abdomen.

The arrangement of the lumbar nerves is similar to the dorsal, but it may be noted, in all the regions of the vertebræ, that, beginning in the superior segment, the cervical nerves send prolongations into the thoracic region and freely inoculate or are blended with its nerve-trunk, the dorsal with the abdominal, and the lumbar with the pelvic or sacral nerves.

As a result of violence to the spine we may have hæmorrhage, laceration of substance, inflammation, peripheral paralysis or neuritis. The consequences arising from these various conditions are important or serious in proportion to their extent, the age of the patient, sex, and the condition of health. One of those pathological conditions may be dependent on the other. For instance, sanguineous extravasation into or along the muscle sheaths, if properly treated and of moderate extent, will rapidly disappear. But under varying circumstances it may give rise to irritation, inflammation or suppuration. Local inflammation may be confined and its spread prevented.

As a rule, however, unless very great injury has been inflicted, the processes of repair in the spinal coverings are rapid and complete. This may be explained partly, perhaps, by their greater vascularity and elasticity.

There are, nevertheless, occasions when a muscle is subjected to sudden and considerable strain; the result may be very serious. Such we sometimes meet with, in those cases of irreducible luxations at the shoulder joint, in which the muscle has lost its elasticity with contractility, and we fail to reclaim the head of the humerus in position after replacement. Dire results may follow rupture of the meningo-rachidian veins. Their walls are very thin, hence, when ruptured, fail to close in the rent. Bleeding from these vessels is a most prolific source of secondary inflammation, of the meninges and pyelitis, by pyogenic processes, propagated either through the lymph channels or the blood vessels, which, in this situation, communicate very intimately.

Primary and direct disorganization of the osseous structures of the spine, without mortal implication of the medulla-spinalis, or such a lesion as will at once and permanently destroy the conducting power of the spine below the area of contact, is very rare.

Pathological changes involving the bones of the spine, after injury, are mostly secondary, and are not often seen, except in early life. Even then, when met with, after an alleged injury, it might become an important question to decide

just what part the traumatism exercised as an etiological factor in the initial changes, or whether or not the necrosis or caries was rather attributable to influences originating within the organism itself, the development of which, immediately following accident, being rather an adventitious circumstance.

The same observation might apply to synovial implication of the manifold articulations of the spine.

In all grave spinal traumatisms, provided the patient receive immediate shock, spinal-meningitis arises, and, in time, the brain shares in the changes which commenced in the cord. Hence, when the basillar membranes are reached, and those of the medulla-oblongata, the respiratory centers become the theater of inhibitory action, and life is quickly terminated.

The subarachnoid cavities of the brain and spinal cord freely communicate. In serious injuries of the cord we often have premonitions of approaching dissolution, accentuated through the nerves coming from the cord, within the skull, while all the mental faculties are yet undimmed, and the patient himself is warned of the terrible change which awaits him only by indications made manifest through those nerves which preside over respiration and phonation.

Very much has recently been written concerning what is designated "concussion of the spine"—a condition which has no definite pathology, and the existence of which is mostly based on a series of vague and ambiguous symptoms. In other words, it is revealed mainly by clinical phenomena.

It is alleged that its striking characteristic is the fact that it manifests its effects only after the lapse of considerable interval from the time of injury; is exceedingly insidious in its onset, but withal, may have a speedy and favorable termination; that it is always followed by psychical disturbances of an emotional character, impairment of vision, ataxic symptoms, unsteady gait, pain in the back, headache, and a general breaking down of health.

Many distinguished authorities agree that as a result of violent physical shock, we may have a condition of the brain or cord in which there are well-marked evidences of serious pathological disturbance, and yet, after death, no gross lesions of structure are found to account for them.

No one who has examined many bodies of men or women who have come to their end by a catastrophe but must admit that not infrequently practically nothing can be found which unequivocally accounts for death. Yet, from my own experience, I feel confident that in many of those cases set down as spinal concussion, wherein there is no shamming, pathological changes may be discovered which will account for symptoms. It is preposterous to assume, then, when vio-

lent and concussive force is applied to the body, that that slight, delicate cord, firmly enclosed by the dura-mater, and protected within a powerful, bony wall, will suffer detriment, while the exposed, friable viscera escape.

Dr. B. A. Watson's experiments on animals have definitely decided this question.

The spinal cord, we are told, may become anæmic. The patient, they say, has "anæmia of the cord." It is said to be a morbid condition which arises solely as a result of railroad accident.

A most ingenious theory has been devised to connect cause and effect in this new addition to our nomenclature of disease.

The imagination and credulity of the observing and thinking student are strained to the utmost to reconcile many of the unsupported theories and allegations of its discoverers and votaries.

In order to maintain the theory, and give force to reasoning, something more is demanded than hypothetical assumption and illogical conclusions.

It is imperative and proper that the profession be enlightened on some of those moot points, which have been ignored or warily evaded by those who have written most on this mysterious disease. In the beginning, we must be convinced that the emotional state of terrible alarm, repudiation and suspense attendant on a railway collision are different in quality and magnitude from those which must be of frequent occurrence in the carnage of battle, during the firing of heavy guns, explosions of shells, and springing of mines, from that borne by the wounded when whole limb is torn away, or when the maimed and crippled, unable to withdraw their mangled, bleeding bodies, are ridden over, or trampled on, or the columns of advancing cavalry or artillery.

Can the horrors of railroad calamity exceed those which accompany the crashing destruction of a thunderbolt, when it falls with destructive energy on a dwelling, lifting it off its foundation, leaving it in two, killing outright, in an instant, one or more individuals, yet, with the survivors, how many of them suffer from spinal anæmia?

In our large cities, with their numerous, enormous modern apartment houses of great height, from which occupants or mechanics often fall in every attitude of the body, here, accordingly, the hospital surgeon will meet with every variety of spinal injury. In no case which I have ever seen of spinal injury was there ever observed by that mental aberration which is said to constitute that condition which is said to be an integral part of spinal anæmia.

Next in importance to those symptoms reflecting through the organ of the mind in spinal anæmia is that condition in which the spinal

cord is the seat of pathological changes, or rather its molecular, vascular elements.

It is not clear whether we are to understand by this, that the quantity of the blood present is diminished, or whether its nutritive, reconstructive elements are deficient, for the demands of the cord. Presuming that the pathological condition can exist, as a sequelæ of a violent shake of the body, there is no difficulty in the way of arraying symptoms almost indefinitely, as arising from or dependent upon it.

But, what proof is there from an anatomical, physiological or pathological standpoint, that such a condition is probable; that such a phase of spinal disease is possible; that the vascular supply to the spinal cord is obstructed, diminished or altered, so that its nutrition is disturbed, or that its cellular elements are impoverished, while all the other organs of the body are functionally active? Organs stimulated by the same nervous systems, the same blood current, under the same physical laws and influenced by the physical and chemical changes.

All such proof is totally wanting; nay, on the contrary, in mechanical anæmia of the organ or limb induced by the surgeon, there is no analogy whatever, to the symptoms resulting and those said to be associated with "spinal-anæmia." On ligation of the femoral artery, as it emerges from under Poupart's ligament, we will notice a cooling of the limb arising from the emptying and collapse of the peripheral capillaries and loss of heat. Owing to venous stasis and temporary diapædesis, there is a sense of fullness in the connective tissues; but usually no pain, except where the ligation was applied and perhaps a nerve branch was injured.

With the brain itself, although one or both of the carotid currents is dammed back, we may immediately notice the physical effect resulting; yet nothing will present itself, having the slightest analogy to this new disease. We have other instances of mechanical, accidental, or pathological exsanguination in which every organ must contribute its share in the general loss, the spinal cord as well as others, but the local impoverishment of the spine, here, is not demonstrable by any special symptoms.

From the foregoing, it is evident that there is absolutely nothing whatever, which should permit the continuance of a supposed pathological entity which has no substantial existence. We have no right, in these days, when instruments of percision are at hand, to assume the existence of a malady demonstrable, if at all, rather by therapeutic than pathological proof. It being supposed that certain functional disorders are present, which indicate impoverishment of the cord, medicines are given, which supply tone to the muscles, enrich the blood and act as a spur to the nervous system. But it is inconceivable

how one can infer from therapeutic induction alone, that the spinal-marrow is the center of a morbid change, when the system responds to constitutional tonics or alteratives that act on every fibre in the organism. It would be just as illogical to argue that there was a localized anæmia in the sciatic nerve, when, through some acute malady, the bodily strength is at a low ebb.

The actual pathological condition which the patient suffers from, in so-called spinal-anæmia, is unquestionably a peripheral neuroses, of a neuralgic character. As a matter of observation, it is well known that along the central and lateral planes of the spine there are local diseased areas, whose principal manifestations are pain and hyperæsthesia. This pain may be localized or diffused; constant or intermittent. It is usually regional. It is a condition of adult life, and is much more common in women than men.

There is always a well-marked derangement of the general health. The hepatic functions are languidly performed. The patient has loss of appetite and is constipated. He is pale, leucocythenic and weak. If a woman, there will be menstrual disturbances. What constitutes its essential clinical differences in the sexes, is its local, neuralgic manifestations, its seat of selection.

With the male sex it is very uncommon, though when it does arise, its location will be in the lower lumbar and gluteal regions; or those parts supplied by the peripheral, or muscular ramifications of the posterior division of the lumbar and sacral nerves. Then we will have what is designated lumbago or sciatica.

With woman, these neuralgias generally radiate through the nerve-filaments from the anterior branches of the six upper dorsal nerves, on the left side, and also, along the pelvic fibres of the anterior crural, which penetrate the ovary. Here, too, singularly, pain is most frequent in the left side.

These neuralgias, intercostal and ovarian, then, are a consequence of a general debility, malaria, and functional disturbances, and are not dependent on traumatism of the spinal cord.

These neuroses belong to that class in which the faith-healer and charlatan reap a rich harvest; or in which anyone, who can make a sudden and positive mental impression on the mind, will meet with marked success, when internal medication fails.

Many phases of this, so-called, anæmic spine, will yield to internal, reconstructive remedies, as quinine, iron, arsenic or mercury; good dieting, sea-bathing, change of air, travel, faradization, shampooing, massage, dry cupping, plasters, etc.

The above may seem rather a digression from the strict text; but under the circumstances, it forms an important constituent of our theme, as it is, in reality and fact, no fanciful or imaginary

picture; but is a truthful résumé of what has evidently been erroneously designated "anæmia of the spine."

I have endeavored to completely demolish the artificial and unstable foundation on which it rests, and tried to demonstrate that this "rail-road spinal anæmia" is a myth; but is, unhappily, often a source of distress among many who have never seen a railroad.

Having so far considered the etiology and clinical history of those lesions and derangements attended with definite and precise pathological changes, and other maladies assumed to succeed concussive force applied to the back, it is now necessary to extend our field of inquiry from the parts which directly enter into the composition of the spine, to the cavities which it posteriorly walls in, the abdominal, thoracic and buccal.

The abdominal cavity contains four fixed, solid organs, dependent and suspended, having no bony encasement, and lying immediately anterior to the flexible lumbar curve, and are frequently exposed to injury from indirect violence.

It is in this situation, that is most frequently seen, destruction, limited or extensive, from transmitted force; as when the liver, kidney, a distended stomach, bladder or gravid uterus, suffers laceration or rupture.

The renal organs suffer most frequently. Their juxtaposition to the spine, behind the peritoneum, when their meso-nephron, or the enveloping layers of fibro-cellular tissue, is dense and firmly fixes the organ in position.

With the exception of grave injury of the cord, as a complication, I had never seen but two cases of injuries of the back in which there were evidences of kidney complications in extrinsic lesions. One of those cases, a physician, who, while aboard what is known as a cable-car, was injured. These cars stop and start suddenly; so that, unless managed by a competent gripman, there are almost constant jars and starts, in their working. He had but entered the car and was advancing towards the front, when it gave a lurch forward, throwing him violently backwards against the iron-arm of a seat. The doctor was unable to rise unassisted, and suffered from shock for several hours. The day following injury, he had hæmoptyses and bloody urine. By proper remedial measures combined with rest, after ten days the hæmaturia ceased, and he was able to sit up. His recovery to health was slow, though in time he quite regained his former vigor.

I have never seen hepatic disorganization, as a sequence of spinal injury, unless mental force had been sustained.

This leads me to infer either one or two things in this connection. The liver may suffer peripheral or central disintegration, when this does

not involve the large blood-vessels, with quite unique impunity, as it undoubtedly possesses within itself the property of complete and rapid repair. It may, perhaps, be partly attributable to its situation which, when attentively studied, will be found to have a configuration and position which effectually provide against extensive damage by violence, and guards it against sudden concussive force. It has long been a matter of observation by physiologists engaged in experimental work on the liver, of lower animals, and by surgeons operating on hepatic structure, that if the primary gush of blood could be controlled, little difficulty would be experienced; as the triple compound, circulating through the lobules, possess marvellous hæmostatic properties, and plastic inflammation with rapid coaptation, was the rule.

Only the free, thin-edged borders of the liver are exposed. The solid, compact mass of this organ, has a broad and intimate attachment to the inferior surface of the diaphragm. It rises high up under the shelving margins of the ribs and rests on a surface well calculated to receive and scatter concussive force, as it lies at its anterior, superior, and greater part of its posterior border on an air-cushion—the highly elastic and expanding lung.

I know of no recorded case, wherein the spleen suffered laceration in connexion with spinal injury.

The stomach in a distended state, lying on its posterior surface, in immediate contact with the vertebral bodies, one might expect, would easily rupture. It, however, is singularly invulnerable to physical shock.

Certainly, it goes without saying, that violent concussion, sustained, through transmission, by the uterus, when impregnated more than three months, almost inevitably leads to abortion or premature delivery.

The contents of the thorax, the circulatory and pulmonary organs, are seldom involved in severe injuries to the back. Very often, force brought to bear will so compress the chest antero-posteriorly as to induce multiple, costal fracture. The pulmonary parenchyma is very tough and will resist great pressure. I have never seen rupture of the heart from concussive force, through the dorsal region; although Watson has observed such a complication in his experiments.

An injury of the cervical vertebræ sufficient to compromise the integrity of the buccal cavity, alimentary or air-passages, must be almost inevitably fatal.

MORBID ANATOMY AND PATHOLOGY OF TRAUMATIC SPINAL LESIONS.

Morbid changes of structure, resulting from injuries borne by the spine, vary according to manifold circumstances, to the quality and force

applied; the time intervening from the accident; the age and condition of the patient; the extent of parenchymatous changes and degree of reparative effort.

If the violence have been shortly followed by death, little will be noted, except extensive laceration of the parts, with disorganization, partial or complete, at the seat of injury. There may be ecchymosis of the integuments and evidence of some bleeding in the underlying tissues, its quantity and quality being dependent on the degree of shock, heart depression, chemical and vital changes.

I have frequently noted that when the bleeding is eccentric to the spinal-canal, the blood is commonly more or less coagulated; but when within the bony rings of the vertebræ, whether intra- or extra-meningeal, is always of a dark liquid consistence.

In those who have succumbed from lesions entailing much loss of blood, with compression of the cord resulting therefrom, I have invariably found the hæmorrhage located *external* to the meninges spinalis, and coming from the laceration of the meningo-rachidian or the longitudinal spinal sinuses.

Intra-meningeal hæmorrhage, either from the fine capillaries on the serous surface of the dura-mater or the medulla-spinal viens of the columns, horns, sulci and substance of the cord itself, I have never seen. Possibly it may occur as a pathological process in certain constitutional maladies, but as a result of an injury it can never occur, except in connection with mortal destruction. It is well to remember that the cord, weighing but an ounce and a half, has but from sixty to eighty drops of blood ever circulating in it, that it is swung in a chamber holding nearly three ounces of fluid, by which it is surrounded on every side, and nowhere comes in contact with the bony walls which enclose it.

Hæmorrhage within the theca seldom is seen, *post-mortem*, to rise above the mid-dorsal region. The adjacent fibrous tissues are always deeply stained and occasionally the hæmorrhage will find its way outward through the inter-vertebral foramina in the direction of the nerve-trunks.

I have not yet seen any cases in which advanced changes in the direction of this integration were noted.

When hæmorrhage has been considerable, not disappearing by absorption, we will find associated with it changes attributable to congestion and inflammation. The vessels on the thecal and serous surfaces of the dura-mater are greatly distended, the subarachnoid fluid is turbid, and small flakes of lymph may be seen floating in it. In places the piamater and arachnoid are glued together, by adhesive inflammation. The cord itself is softened, and under the microscope are seen along the periphery of the white matter

round cell infiltrate with leucocytes and granular matter intermixed.

All the membranes are markedly thickened and have a deep congested hue.

The soft tissues overlying the spinal cord in spinal-meningitis, as with all other tissues which overlie an inflamed serous membrane, as those of the abdomen, thorax and skull, are always considerably thickened and distended by an inflammatory exudate.

There will be found at times, evidences of bone implication, synovial destruction within the capsular ligaments, and sero-purulent formations.

The pathological changes observed during life after spinal injuries, are important to correctly comprehend. They may, for purposes of description, be divided into four classes: 1. Eccentric lesions; 2, centric lesions; 3, organic lesions; 4, functional disturbances.

Eccentric lesions are those of the structure which are situated external to the spinal canal and involve the bony architecture, the motor leverage, circulatory system, mainly, and peripheral nerves. They are dependent on pressure, tension or laceration. In the vast majority of cases, being of a trivial nature, they give little inconvenience; but when the back has borne great and considerable force, we may witness such lesion of muscle or other structure as will cause temporary or permanent loss of function. If inflammation supervene, the residuum of its deposit may undergo fibrous changes and so bind the sinewy structure together, as to occasion muscular ankylosis, pressure on the nerves or blood-vessels and amyotrophic changes, in all the tissues. If the integuments and the subjacent tissues are lacerated we can readily comprehend how, through the intimate connection between the dorso-spinal and meningo-rachidian vessels, septic processes may be transported to the enveloping membranes of the cord.

Primary congestion or inflammation in the inter-muscular connective tissues seldom give rise to organic changes, and readily subside. But a severe injury, the widespread effects of which involve *en masse* all the tissues, may be followed by a low grade of inflammation, implicating the vascular supply, giving rise to a phlebitis or strombosis of the superficial or deep veins, in this manner seriously interfering with nutrition and inducing a softening or wasting of the muscles. The bony structure of the spine usually escapes an injury unless great violence is borne. In children, however, this immunity does not obtain, especially when tubercle is inherited.

In fractures of the spine, so-called, everything will depend on the direction which the fragments have taken. If the broken bone be crushed in, on the cord, we will have hæmorrhage, inflammation and softening, while if there be slight displacements, the cord may escape. We have

no proof that the bones of the spine will regenerate; certainly if they are allied anatomically and physiologically with those of the cranium, which is claimed by some anatomists, then they are destitute of osteogenetic power.

Simultaneous or consecutive osseo-arthritis changes of an inflammatory nature in the vertebral joints seldom extend to the cartilagenous pulp between the bodies in the absence of constitutional cachexia. The pain along the spine in various regions according to where concussive force is applied, is dependent, I am convinced, rather on a low grade of cellulitis, involving the muscles and tendons, than a peripheral neuritis.

Centric lesions of the cord, accentuated by clearly defined symptoms and resulting from trauma, are very seldom met with. Although I have seen and treated now more than one hundred and fifty cases of fracture of the vault of the skull, up to the time I reported them in Oct., 1890 (Trans. New York Medical Ass'n., 1890), and saw more than fifty fractures at the base, besides very many cases of cranial injury in which spasm or paralysis followed and the patients recovered; in that seventeen years experience I had under my care but ten spinal injuries of an intrinsic character, so that on a reasonable calculation, in falls, blows, or collisions, it may be said that the proportional injuries of the cord with that of the brain under those circumstances, was rather less than one to twenty.

As the spinal cord cannot be stretched nor sundered by concussion, we must direct attention mainly to the effects of pressure; pressure by bone, luxated or fractured, or pressure by blood; by an excess of serum, lymph, a plastic exudate or pus.

Should a large spicula of bone be driven in or through the meninges, the cord is irreparably disorganized beneath it. Fractures of the lateral arches, involving the transverse processes, imply great violence, and I believe are always fatal, either immediately or remotely. The spinous processes in slim subjects being very superficial, give way to force most frequently; but owing to their inclined, overlapping adjustment and numerous ligamentous supports, are dislodged with difficulty. When bone pressure is moderate but constant, along with producing paralysis, involving the motor or sensory nerves, or both, it gives rise to meningitis and myelitis. Before necrotic processes of the osseous structures is complete, the patient has usually succumbed.

Intra-spinal hæmorrhage, after severe injuries of the back, by pressure, may induce temporary paralysis, meningitis or molecular degeneration of the medullary substance. The pathological changes which it induces are those characteristic of pressure exercised by a solid substance. The effused blood being confined within an air-tight chamber, in which the circulation is necessarily languid, absorption is slow and imperfect.

Spinal meningitis, resulting from trauma as a primary affection, is very rare, except in the presence of fracture. Commencing as a local and well-defined affection, its tendency is to spread upward into the basic meninges of the brain.

The peripheral sensory nerves in spinal meningitis are always morbidly susceptible to impressions, and the reflexes in the early stages of the malady give rise to intermittent or constant spasm of the muscles.

Authors have in turn framed different theories to explain the predominance of one phenomenon over the other in those meningeal inflammations, when at one time we will have anæsthesia or hyperæsthesia in a limb which is motionless.

They have sought to justify and prove their conclusions by experimental physiology, ascribing one set of symptoms as attributable to pathogenic changes in the antero-lateral columns of the cord; another, to the posterior columns; to the grey matter and white substance, alternately. These views are, however, merely speculative, and are lacking the confirmation of post-mortem examination. Admitting, nevertheless, their scientific accuracy, it would, as far as we know, in no way aid their surgical management. Meningeal inflammation, although, as its stages merge one into the other, thus inducing pain, spasm and paralysis of the lower regions of the body, is compatible with consciousness and life, until the upper cervical segment of the spine and base of the brain are involved.

Irregularity of cardiac and respiratory action, with twitching of the facial muscles, loss of speech and the power to swallow, slowly developing deafness and dimness of vision, announce that the roots of the cranial nerves are involved and that the end is near. As we invariably witness spinal manifestations in cerebral meningitis, so in grave spinal meningitis the vital and psychological functions of the brain never escape. Organic lesions of the cord, arising independently of constitutional causes, are infrequent.

The medulla-spinalis is seldom involved in inflammatory processes without the participation of the meninges, the latter being the primary structure to take on inflammation.

When the spinal marrow undergoes interstitial or molecular disintegration, as a result of trauma, along with constant pain over the integuments of the back, which often, too, is reflected along the sensory nerves into the extremities, we will see paralysis, spasm or hyperæsthesia, which will correspond with that area of the cord supplying the affected group of muscles.

As I have never seen the seat of traumatic myelitis or pathological changes limited to the cords alone, post mortem, I cannot speak from personal observation; nor can I find such a condition even mentioned by such world-renowned pathologists as Virchow, Paget, or Billroth.

We must turn to medical pathology for information relative to those fine structural changes which occur in the pulpy matter, for, no doubt, like pulmonary tuberculosis and Bright's disease of the kidneys, those microscopical changes in the nerve-cylinders invariably depend on systemic influences solely, and not on violence of any description; hence what has been written so fully relative to pathological changes in the spinal marrow has but little application to surgical or traumatic lesions of it.

Of the functional neuroses of the spine, their name is legion. In a surgical essay on spinal diseases, their consideration from a pathological stand would seem a work of superrerogation, if it were not claimed that many of them had their starting point in an injury. They have been designated spinal anæmia and spinal congestion, spinal concussion, etc., and one author (Hammond on the Nervous System, page 217) has even gone so far as to further subdivide them on a physiological basis into anæmia or congestion of the antero-lateral and posterior columns. An imaginary pathology has been elaborated, with considerable detail and circumspection, to correspond with the views and notions of the authors, and we are told now that precise localization of spinal lesions is a matter of great simplicity. We are told that certain cells within the grey matter and white substance degenerate and regenerate under the influence of the circulation, which, at one time, is excessive and another diminished; that one train of symptoms is dependent on one phase of the blood supply, another on a contrary. Now, as no one has yet been able to demonstrate by an autopsy the pathological changes, if any are present, the necessary proof is wanting to support these assertions.

These allegations are dependent wholly on empiricism. When subjected to the rigorous test of scientific analysis, they fade away into nothing.

Very many of these spinal neuroses of a functional nature are chiefly hysterical, epileptic, or choreaic, probably dependent on hereditary influences, sex or habit, which act through the blood. Their pathology cannot be definitely written yet, for it is not understood. Without question, however, we may rather look to the cerebral organs for the central trouble than the medulla-spinalis.

THE DIAGNOSIS OF INJURIES OF THE SPINE.

Before the days of Lænnec, every species of acute inflammatory affection involving the lung, its parenchyma, its tubular structure, and serous investment, was designated "a pleurisy," and all were treated on the same general principles, by essentially the same remedial agents. But there came forth a genius, who applied the revelations of physics to vital phenomena within the

human body, and he taught how, by the aid of the eye, the ear and the tactile sense, we might not only recognize the different structures involved, but that we could, with certainty and precision, estimate the progress or retrogression of the pathological changes within them. Now, though of great value, this application of physical laws to the elucidation of pulmonary diseases, for diagnosis and prognosis, yet the late famous clinical teacher, Thomas Watson, said, in speaking of pulmonary disease: "It may seem paradoxical, but the very perfection of the physical diagnosis of pulmonary diseases, has often constituted an impediment to their treatment."

Spinal diseases taken collectively, as a whole, were in the same chaotic state, at the beginning of the present century, as were maladies of the lungs before the days of Lænnec. But through the discoveries and experiments of Magendie and Bell, the functions of the nerve roots are now known, and by the aid of Brown-Séquard and other experimental pathologists, we have been made aware of the special properties resident in the columns and matter of the cord, itself.

Surgical pathologists have made it possible for us to differentiate the inflammations or pathological changes in the various structures which envelop the medullary cylinder, from within outward. And hence, to-day, not as formerly, we are enabled to speak definitely of the idiopathic or traumatic affections which may occupy any area of the spine, or its organic components.

It may not be always possible to effect a definite diagnosis immediately after an injury of the spine has been sustained, unless very great violence was applied, and the cord itself suffered direct and positive pressure from displaced bone, or fracture, under which circumstances, complete and instantaneous paraplegia is invariably a symptom of mortal omen.

At the first visit to our patient, we may find him suffering severe pain in all the joints below the sacro-lumbar articulation and upward along the lateral planes of the spine. He is unable to raise the body or elevate the lower limbs without very great difficulty, even if it is possible at all. He has perfect control of his sphincters, and sensation is nowhere impaired.

The family, friends, or patient himself may now demand of the medical attendant information as to the nature and extent of the injury. This cannot be stated at this visit, but I feel assured, from my own experience in a large number of spinal injuries, that, however, it will seldom require but a very few days before we can, with certainty, say whether the spinal marrow is involved or not. Hæmorrhage, inflammation, serous or purulent effusion, will present symptoms of such a clear and unmistakable type, that one cannot be deceived or incapable of interpreting their clinical significance.

The most serious, but infrequent, lesions attending violent injuries to the back, are those which have reference to the cord and its membranes.

These are of a primary and secondary character. With the former, we are promptly apprised of direct medullary implication, by the presence of paralysis in the lower members, complete or incomplete. Primary paraplegia after the injury is usually induced by pressure, which effects the disorganization of the cord, destroying its conducting power. We are not always able to precisely define the exact situation or extent of pressure, for an arch or lateral plate of vertebra may have been fractured and forced into the spinal canal at the time of accident, but, owing to the elasticity and strength of its connecting ligaments, with the rebound, it is retracted away from the indented cord. And, on examination, although there may seem some slight increased mobility of a projecting vertebral spur, we cannot always assume that there is displacement.

As a diagnostic aid, we might have recourse to an exploratory incision, so as to effect a more accurate estimate of the effect of the injury, and to guide us in the way of treatment.

But, although this might be a theoretical advantage in serving a dual purpose, yet practically it cannot, only in very exceptional circumstances, be regarded as a permissible procedure. Possibly, under extreme circumstances, might a free incision into the tissue be allowed as a therapeutic measure—as a diagnostic, almost never.

Fortunately, in the presence of total inhibition of the spinal or neural functions in the lower extremities, we may pronounce the lesion in the spinal cord one of an irreparable character, resulting from direct and permanent disorganization of such a description that, even though the cord were stripped of its investments and completely accessible, we are powerless in the way of instituting remedial measures.

Traumatic compression, laceration, or disintegration of the spinal cord, accordingly, may be said to be a condition of easy diagnosis, when complete paraplegia is present. Certainly, when bone is fractured, but is not displaced, and no symptoms are present indicative of paralysis, we cannot, in the deeply buried lines of the back, always make an immediate diagnosis. It is of little consequence under these circumstances, however, that we fail to correctly ascertain the extent of lesion, for it will in no way influence remedial measures, or affect prognosis.

Unfortunately, however, when the cord and its membranes become secondarily involved, some days or weeks after injury, diagnosis is attended with many perplexities.

Next to osseous pressure, in producing organic changes in the spinal cord, will come hæmorrhage. Paresis following hyperæsthesia within twenty

four or forty-eight hours of the injury, will be suggestive of intra-spinal hæmorrhage. Its volume may be estimated by the extent of paralysis and the areas affected. When the viscera supplied by the lumbar plexus show evidences of paralysis, and the sphincters of the bladder and rectum fail to act, we may assume that the effusion has mounted up to the dorso-lumbar junction.

It may require a very nice discrimination in diagnostic tact to differentiate, at the outset, intra-spinal hæmorrhage from meningeal inflammation. But the patient's exsanguinated condition, the deep-seated pain from pressure, the absence of chills, acceleration of the pulse and of rising temperature, all point to the exclusion of inflammatory changes having yet occupied the meninges.

Our diagnosis of intra-spinal hæmorrhage will be corroborated if, within a week's time, amelioration of the symptoms is present, and restoration of function is being gradually reëstablished.

Extensive hæmorrhage from the dorso-rachidian vessels, when profuse and localized as an intra-muscular hæmatoma, may be recognized as a sanguineous effusion which, in the healthy individual, rapidly vanishes by absorption.

Changes of an inflammatory character in the spinal cord are manifested by a diversity of symptoms. First, by constitutional phenomena, which profoundly impress the nutritive processes and local conditions. The patient has fever, quick pulse, rising temperature, is thirsty, has neither sleep nor appetite.

There is always pain in the back in traumatic spinal meningitis, associated with extreme peripheral tenderness, localized or extensive anæsthesia along the extensor or flexor surfaces of one or both limbs. Thus a clonic spasm, unilateral or symmetrical, is always present, provided there has been no implication of the medulla. When there is this association, the cord having lost its connective power below the seat of lesion, spasm will be noticed only above this limit.

We are perhaps justified, in the presence of a certain set of symptoms, in assuming that we may, at the outset, be able to localize the limit of meningeal inflammation. This would seem all the more positive when, in the presence of every symptom of incipient meningitis, we succeed, by the active interposition of therapeutic resource, in arresting its progress. Accordingly, we may assume that the lumbar segment, the *clauda equina*, is the primary and only region affected when paralysis, paresis, hyperæsthesia, spasm or muscular twitching, is confined to the parts supplied by the nerves whose roots are located in this district. Stiffness, pain or spasm of the muscles supplied by the lower dorsal segment, those muscles animated by the lower six dorsal nerves, viz.: the deep spinal muscles of

that region and the three sets of muscles which anteriorly and laterally wall in the abdomen, the external and internal, oblique and transversalis. Hence, the muscles of the back are hard, stiff and unyielding, and it is noteworthy at this juncture, that the patient begins to complain of a most oppressive sense of weight and constriction over the abdomen, which he compares to being drawn tightly by an encircling cord, the abdominal muscles pulling in an opposite direction; or having a heavy weight resting on the præcordia. The movable wings of the thorax are locked and fixed by an intermittent spasm of the lower intercostal muscles, and respiration is maintained principally, now, by its auxiliary muscles, the cervical and scapular, with the aid of the diaphragm.

Meningeal inflammation having compromised the entire dorsal district, we have anticipated it, as it were, *i. e.*, knowing, when this area of the arch is invaded, our patient—whose mental faculties remain as yet unclouded—is warned of his impending danger, and given time to prepare himself and arrange his affairs—as, with but another slight advance into the cervical region, the implication of post-thoracic and the phrenic nerves, when asphyxia will terminate the struggle.

The diagnosis of cervical meningitis is unimportant, as the general meningeal disease is wholly beyond our control, and swiftly fatal, when this area is occupied.

I have seen in several fatal cases, a rather singular clinical phenomenon, in the upward march of inflammatory changes. It was this: that whereas the extension of the disease, from the lumbar to the lower dorsal district, may occupy several days and be extremely insidious in its advance, but, when it was finally manifest in the dorsal segment, it often, within the lapse of a few hours, spread into the cervical region and quickly terminated life.

CONCLUSIONS.

In dealing with the foregoing subject, my aim has been to compress within a small compass as much as possible, without omitting any important detail; but I fear, with the space at my command, in this I have but partly succeeded. Quotations and the historical part of the subject have been largely omitted.

In presenting the study of spinal lesions my object has been, rather, to make it clear and comprehensive than to confine myself rigidly to any arbitrary arrangement of matter; for, regardless of what pains may be taken in constructing an article, under various headings, the divisions and subdivisions are often more relative than absolute.

Very little or no notice at all is given to the subject of traumatic lesions of the spine, in text

books, or even encyclopædic works on surgery; hence, we are justified in assuming that serious injuries of this structure are rare, or else, that surgeons have given them very little attention.

An attempt has been made here to isolate the complexity of lesions following severe injuries of the back, and not confound the consequences of one with the other, to demonstrate that grave injury may be sustained in the rachidian region without any implication of the cord.

Accordingly, in the light of our present knowledge, and after a careful study of normal structure and function; the physics of force which give rise to spinal injury; experimental investigation, clinical phenomena, pathological changes and morbid anatomy, it may be definitely stated:

1. That in the vast majority of cases in which complete paraplegia immediately sets in, after spinal injury, it may be assumed, with almost positive certainty, that the medulla-spinalis has sustained a palpable lesion of its integrity, which usually ends mortally.

2. That there is no proof that mere concussive force will either simultaneously or consecutively ever lead to paralysis, without inducing well-marked and positive pathological changes in the anatomical elements of the cord.

3. Physical force and the psychological effects of fright being the same in railroad as other injuries, there is nothing to justify the claim that there are grave lesions of the spine resulting from railroad collisions which are characteristic and peculiar.

4. There being no proof of the existence of such diseases as anæmia or hyperæmia of the cord, as pathological entities, they are entitled to no place in the nomenclature of traumatic spinal diseases.

5. Eccentric lesions of the back, without any implication of the cord, may, nevertheless, by pressure on the meninges secondarily give rise to meningitis, local or general; also by infection, propagated inward, ultimately effect the medulla-spinalis. Those extrinsic injuries may, too, of themselves, by inducing pathological changes in the bones, cartilages, joints or muscles, occasion a permanent weakening or loss of power in the back.

6. It should be constantly borne in mind that there are always essentially two different and distinct sets of pathological lesions which result from spinal injury, viz., those involving the cord, of rare occurrence and generally fatal, and those exterior to the spinal canal, very common, but seldom giving rise to serious impediment of function.

ELECTRO-DIAGNOSIS IN BRAIN AND NERVE INJURIES—METHODS USED AND THE APPARATUS REQUIRED.

Read before the Section of Medical Jurisprudence and Neurology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY W. H. WALLING, M.D.,
OF PHILADELPHIA, PA.

There are two very important propositions to be considered in connection with electro-diagnosis, the first of which is, an adequate knowledge of electro-physics and electro-physiology, and the second, the need of the proper apparatus with which to conduct such investigation.

The first proposition, or a proper understanding of the subjects named, is so obviously essential that it is scarcely necessary to discuss it.

The apparatus required for accurate electro-diagnosis merits our careful consideration. While with an ordinary faradic battery and common electrodes the approximate condition of a nerve may be arrived at, our tests will be of only a proportionate value.

The batteries, meter and controller that I use here to-day were made by Mr. Otto Fleming, of Philadelphia.

Unfortunately, we have no definite standard in this country for our faradic coils, or for the size of our electrodes, hence the resulting confusion in comparative tests by different operators. It is to be hoped that the American Electro-Therapeutic Association will, at its next meeting, appoint a committee to consider this very important question of the standardization of our apparatus and electrodes. This is secondary in importance only to the proper standardization of the fluid extracts and tinctures of the U. S. P., which I so strenuously advocate.

For electro-diagnosis three different currents are used, the faradic, the galvanic, and the franklinic. The faradic coil, which I use in diagnosis, which I here show you, is constructed upon the DuBois-Reymond principle, and graduated, by means of a scale, into centimeters and millimeters. The cell used to operate this coil is a modification of a grenet cell, and has an electro-motive force of one and a half volts. For my stationary coil I use two modified Law cells, as they are less troublesome, and are quite constant in action. The dry cells have not, as yet, met our expectations, when used upon the faradic coil. It must be remembered that the cell in all faradic machines, is on what is termed short circuit when in use, hence the dry cell having a tendency to rapidly polarize, soon runs down, and the battery will not work until the cell has time to recover.

This apparatus is supplied with a slow, as well as a rapid interrupter, and the movements of the former may be regulated to suit the operator.

THERE are in the United States and Canada forty-seven medical faculties which admit students of both sexes, and nine for women only.

With a machine constructed upon this plan, the exact coil distance required to produce a contraction, if one be obtainable, may be observed and recorded, and active comparisons made from time to time.

It has been repeatedly stated that it makes no difference which of the two poles of the faradic battery are used, as the reaction of nerve and muscle is the same for both poles. I dissent from this statement. In testing a nerve with my office coil, for instance, I find that I can get a contraction with the cathode from six and a half centimeters coil distance, while seven and a half centimeters are required with the anode to get the same contraction. This from the primary coil. With the secondary coil the same contraction was produced by two centimeters c.d., cathodal closure, and two and eight-tenths of c.d. were required with the anode.

The electrodes selected to make the first examination should be used throughout the case. Erb recommends that the active electrode should be ten square centimeters surface measure; Stintzing one of three centimeters surface. Erb's instrument is the one most generally used. Both electrodes should be covered in the same manner, preferably with absorbent cotton, wetted to the same degree, in the same solution, and be placed upon the same spots on the body at each examination, and the pressure should also be the same near as possible.

The size of the electrodes used make a vast difference in the amount of current required in order to produce a contraction.

For the purpose of general diagnosis, the patient is prepared by removing as much of the clothing as may be necessary, and, if a female, protected by a sheet or loose wrapper, and seated upon a suitable stool, upon which a wet sponge electrode is placed, attached to the positive pole of the secondary coil of a faradic machine. The operator then takes a small, well-wetted sponge cotton-covered electrode, attached to the negative pole, and, commencing at the nape of the neck, with a current plainly perceptible to the patient, passes down the back upon both sides of the spinal column, noting the effect produced. If there are tender spots, they will be quickly apparent by the patient wincing, or saying that it is painful. Note the coil distance required to excite these spots. Anæsthesia may be present in some areas, and more current be necessary to produce an impression.

The tender spots indicate points of greater or less inflammation. Blood being the best conductor of all the tissues of the body, all such foci of congestion or inflammation offer less resistance to the current, consequently the greater amount seeks to pass in that direction, and cause the reaction by reason of such density. Test both sides of the spinal column, and note all the reactions.

Pain is not always an indication of an inflammatory condition, or of a lesion, as when the sponge is passed around the sides of the patient, and over the ribs, more or less pain will be experienced, due to the effect of the vibrations upon the periosteum. This effect is always seen when the faradic current is used over bones which are superficial, such as the scapula, etc. As the electrode passes over the motor points of some of the abdominal muscles, they will be strongly contracted, but this is, as a rule, of no particular significance. For testing for anæsthesia, this small electrode will be found useful; also for testing the electro-cutaneous sensibility of various parts of the skin. It is made of a large number of copper wires, closely approximated, but insulated from each other, and placed in this hard-rubber case. The coil distance necessary to produce a sensation upon different parts may be compared. This electrode is to be attached to one pole of the secondary coil, and the other placed upon the sternum, and the coil distance required to produce a sensation noted. A painful impression is then given, and noted, when the active electrode is removed to the opposite side of the body, and the same test made, when the two may be compared.

Diminution of sensibility, or sensory irritability, is present in nearly all lesions of the spinal cord and peripheral nerves, which are serious in character, and is also present in many cerebral affections.

Stintzing has tabulated the normal reactions of nerves to the faradic current, a few examples of which I present. The numbers are the millimeters on scale:

Musculo-cutaneous, contraction at 15 m.m.

Frontal branch of facial, 25 m.m.

Ulnar, at olecranon, 31.5 m.m.

Crural, 38.5 m.m.

Radial, 45 m.m.

As no two machines are alike, the value of these tables are only approximate.

THE GALVANIC BATTERY.

As the galvanic battery is our sheet anchor in definite electro-diagnosis, it is essential that everything be as perfect and complete as possible. The battery must be able to maintain a fairly constant potential, and for this purpose, especially for an office, or stationary battery, the Law or Leclanche cells are the best. The cells should be coupled in series; that is, the zinc of the first cell is attached to the carbon of the second, the zinc of the second to the carbon of the third, and so on until all are connected, the battery consisting of from forty to eighty or more cells. The two terminal wires from the end cells are run to the controller and meter, thus completing the circuit. This is the common arrangement, but I prefer to have each cell connected

with my switch-board, so that I may select any number, from one up to the whole number. My reasons for such arrangement are, that where you are using the whole battery, and attempt to control the current by means of the rheostat, the ampérage is alone controlled, and not the voltage. In this connection, I desire to enter my protest against the use of the Edison electric-light current for medical purposes. It will charge your secondary batteries, light your houses, your streets, and some of the cavities of the body, but I consider it unsafe and unreliable when used in place of a chemical galvanic battery. There is too much voltage, or electro-motive force, which cannot be properly controlled. But there is the greater danger of a short circuit somewhere, and of the whole current being thrown in upon an unsuspecting patient, with damage to health, and possible loss of life. Such accidents have happened, and are liable at any moment to be repeated.

It is also on account of the high voltage from the primary battery, when all the cells are constantly in circuit, that I object to the series arrangement. Suppose, for instance, that you wish to use one-half of a milliampère of current upon the eye; of what possible use have you for eighty to a hundred volts of pressure? Not only is such pressure useless, but it is hurtful, if not positively damaging. This I have demonstrated again and again, to my entire satisfaction. For instance, one of a series of patients referred to me by Prof. Keyser for treatment for facial paralysis, and now under my care, complains of intense pain in the supra-orbital nerve, with only one-half of a ma. of current, when I have fifty cells in circuit, the current-controller being also used, but bears one ma. from twenty cells, not only without pain, but with positive comfort. A painful and sensitive nerve quickly differentiates against voltage. It seems evident that as we throw in resistance, by means of a rheostat, we increase the pressure, and my rule is to use only just a sufficient number of cells to give the current strength I want, and no more. All above that number is a waste of force, and a positive disadvantage.

When making a diagnosis, the meter, but not the controller, should be in the circuit. DeWatteville's method is to place the electrodes in position, and commence with ten cells, adding cell by cell as needed, to get the reaction desired. I have tried various methods, but have gone back to DeWatteville's plan, as being the most satisfactory. For brain testing I have a separate series of ten cells, arranged according to my plan, and kept most exclusively for the purpose named.

Attention to polarity was seen to be of advantage, when using the faradic battery. With the galvanic, polarity becomes of prime importance, for the reaction of nerves is distinctive for each

pole, and gives definite and unvarying results, when intelligently applied. Suppose that we wish to test the median nerves, in its most superficial portion, about two inches above the annular ligament. With the anode, or positive pole, placed on some convenient point, place this small electrode, attached to the cathode, or negative pole, upon the nerve, and turn on the current. So long as there is no break in the current, there is no movement of the muscle, differing in this respect from the faradic current. Having say two or three ma. the current is broken, and again suddenly closed. A quick, sharp, lightning-like contraction of a healthy muscle takes place, quickly subsiding. Upon reversing the polarity of the battery, we will find that it requires more current to get the same contraction with the anode, than it did with the cathode. Upon this has been based the following formula of normal reactions of nerve and muscles.

First we have cathodal closing contraction, c.c.c.

Followed by anodal closing contraction, a.c.c. and this

Followed by anodal opening contraction, a.o.c.

The two latter may change places and still be classed as normal, but if the anodal closing contraction appears first, we then have what is termed the reaction of degeneration, generally expressed by the letters, R. D.

There is a fourth reaction, the cathodal opening contraction, but it requires too strong a current to produce it, and being painful, I do not attempt it in health. Ordinarily, we will get the three contractions above noted with about the following current strength, that is in healthy subjects:

Cathodal closing contraction, with 2 to 5 milliampères.

Anodal closing contraction, with 5 to 8 milliampères.

Anodal opening contraction, with 5 to 8 milliampères.

These numbers are only approximate, as much depends upon the condition of the subject, whether there be much or little adipose tissue to deal with.

To illustrate the reactions, we will take a case of injury to the arm, the result, we will say, of a railway accident. The patient states that the arm has been rendered useless. Having bared both arms, and the chest of the patient, place a large, well wetted sponge, or other electrode, upon the sternum, connected with the positive pole of the faradic battery, and with the small negative electrode, test the well arm first, noting the distance necessary to produce a contraction. Use the secondary coil in such testing. Next test the diseased arm, noting, as Bramwell tersely puts it:

"1. Whether a muscular contraction is produced or not.

2. If a contraction is produced, what is the minimum strength of current required to produce it, and whether the character of the contraction is in any way altered from the normal.

3. The strength of current and the rapidity (whether slow or quick) of the interruptions required to produce the maximum amount of muscular contraction." It is better, in all such cases, to test corresponding groups of muscles, as above stated, so as to compare results.

Next test with galvanic current and note

"1. Whether a muscular contraction is produced or not.

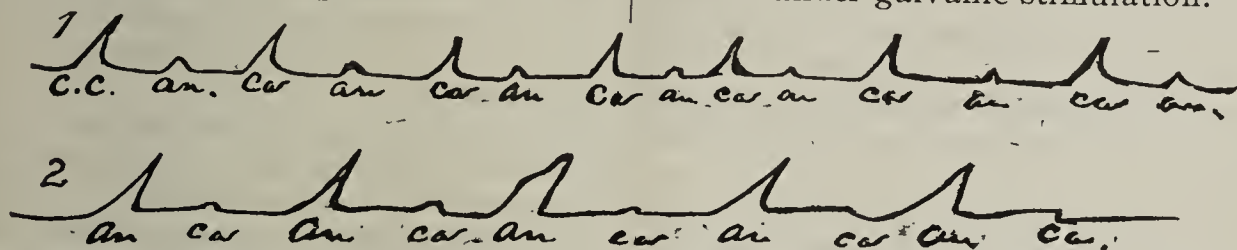
2. If a contraction is produced [*a*] what is the minimum strength of current required to produce it; [*b*] the order of the polar reactions; [*c*] the character of the contractions, whether healthy or not; [*d*] the strength of current required to produce tetanus; [*e*] whether the con-

tractions are more easily excited by slow or quick interruptions of the current."

In order to get the most satisfactory reactions, the muscles must be relaxed. If you get conflicting or confusing reactions, and the patient is resisting the current, he must be placed under ether, or some other anæsthetic, when the proper reactions will readily appear.

If, however, you find the normal formula reversed, that is, if anodal closing contraction comes before cathodal closing contraction, you may be assured that there is degeneration, as the reactions of degeneration cannot be simulated.

We are here dealing with a peripheral paralysis, and the reaction of degeneration appears, because the nerve has been separated from its trophic center in the cord. I herewith present a graphic representation of the normal reaction of a nerve under galvanic stimulation.



The first shows the normal reaction, with a quick sharp contraction of the cathodal closing, while the second shows the reversal of the formula, with the anodal closing contraction appearing first, which is the reaction of degeneration.

The following table, taken from Dr. Adams' little work, and compiled from Erb, shows the relationship between the reaction of degeneration,

and the histological changes accompanying it, this "reaction of degeneration depending upon a specific histological modification of the irritable tissues, called 'degenerative atrophy,' and this degeneration itself is due to an interference with, or a stoppage of, the peculiar influence of the gray matter upon the nerves and muscles, known as 'trophic' influence."

Seat of Lesion.	Prominent Symptoms.	Electrical Reactions.	Pathological Conditions and Their Location.
Path of impulse from the brain (antero-lateral columns); or the brain itself.	Paralysis. No muscular degeneration.	All normal.	Lateral sclerosis (idiopathic or from cerebral disease).
"Trophic centre" for the muscle, and also the path of impulse from the brain (antero-lateral columns).	Paralysis. Muscular degeneration.	Nerve: Normal. Muscle: Qualitative and quantitative alterations. (Partial R. D.)	Amytrophic lateral sclerosis.
"Trophic centre" extending to multipolar ganglion cell of the anterior horn of gray matter.	No paralysis at first. Muscular (afterwards nervous) degeneration.	Nerve: At first normal; afterwards diminished. Muscle: Qualitative and quantitative alterations. (Partial R. D.)	Progressive muscu-atrophy (of central origin). Bulbar paralysis. Mild acute poliomyelitis.
Multipolar ganglion cell of the anterior horn of gray matter.	Paralysis. Atrophy of muscles and nerves. Abolition of reflex actions.	Nerve: Reaction of. Muscle: Degeneration.	Anterior poliomyelitis. Infantile paralysis. Lead poisoning.
Motor nerve-fibre.	Paralysis. No degeneration.	All normal.	Light form of rheumatic, traumatic, or pressure paralysis.
Motor nerve-fibre and path of trophic influence to muscle.	Paralysis. Muscular degeneration.	Nerve: Normal. Muscle: Qualitative and quantitative alterations. (Partial R. D.)	Middle form of ditto.
Motor nerve-fibre, path of trophic influence to muscle, and path of same to nerve.	Paralysis. Muscular and nervous degeneration.	Nerve: Reaction of. Muscle: Degeneration.	Severe form of ditto.
Muscular fibre.	Pseudo-paresis. Simple atrophy.	Normal, or diminution to maximum excitation.	Muscular wasting in phthisis, etc., and in diseases of the joints. Idiopathic myositis.

There is another and important factor to be considered in all these cases, and that is the resistance of the patient. When a galvanic current is passed through the tissues of the body, it meets with resistance, differing with the portion traversed. The dry epidermis offers the greatest resistance, presenting, according to some observers, as high as three hundred times as great a resistance as that of all the intervening tissues, when a current is passed by percutaneous application, with two layers of the epidermis intervening.

This resistance may so vary upon different sides of the body, as to be very misleading, unless carefully considered. For instance, if, in testing an arm for a supposed lesion, you found that it required a much stronger current to produce a contraction upon one side than upon the other, before diagnosing the injury, test the resistance of the two sides, and you may find the difficulty there. This testing is done by means of resistance coils, which should be attached to every office battery, and range in power up to at least 20,000 ohms.

Still another point in this connection is, that as the current passes through the body, the resistance more or less rapidly declines, due to two causes: the moistening of the dry epidermis, and, according to Prof. Rhoe, the electrolytic arrangement of the molecules in the track of the current. Both have their influence.

In some conditions, I have found cocaine cathexis to be of great value in determining whether a lesion was superficial or not. For instance, in a case of severe tic, if cocaine be used upon the anode, and applied to the nerve, and relief be not obtained, the lesion is deeply seated. If, on the contrary, the pain is controlled, the lesion is superficial, and an operation is not, as a rule, indicated.

[Dr. Starr, and Dr. Peterson, of New York, have done much in this direction, especially the latter.]

In testing nerve and muscle, also during treatment, I have noticed some curious phenomena. A case under my care, in which the hand had been amputated, gave, upon tests, and frequently during treatment, sensations of contraction of the muscles of the amputated hand, and the patient complained that the hand pained him, at such times.

BRAIN AND SPINAL CORD LESIONS.

In brain testing, the phenomena are mostly subjective, and yet, as the patient, unless familiar with the reactions, not knowing what to expect, will generally give correct descriptions of what is taking place.

We will take a normal brain, and note some of the reactions produced by the galvanic current,

first noting that there are the following methods of brain galvanization: longitudinal, transverse and oblique. The transverse is subdivided into bitemporal, from the parietal prominences, the mastoid processes, and suboccipital. In a normal, healthy brain, no unpleasant sensations are felt, more than a possible slight dizziness, when a current of from 3, or even 5, and in some instances more, ma. are passed through it, in any direction. By reversing the current, without shock (which should always be avoided), the molecular arrangement having been disturbed, the sensation of dizziness will most likely be produced.

In anæmia, the tissues being but poorly supplied with blood, the reactions might not appear, but pain would follow. In hyperæmia, however, the effect is very marked, and I have had patients almost fall from the chair, when only a very mild current was applied. In cases of brain tumors, the patients complained of great pain in the region of the tumors, when the electrodes rested over it.

The optic nerve is stimulated by both the galvanic and faradic current. The former, however, is the one to use in such testing. When a feeble current is broken or made, with the electrodes placed transversely upon the temples and in other directions, the optic nerve will be stimulated, and a flash of light be noticed. In some cases of paralysis of the orbicularis palpebrarum, I have noticed that this stimulation was very marked in the affected eye, in cases of central lesion. Where the cause was peripheral, the lesion was not particularly marked. In a case of almost complete loss of vision in one eye, the result of a syphilitic iritis, the optic nerve on that side will not respond to any current which I would use upon the head. In the case of a gentleman now under my care, with beginning sclerosis of the brain, I find that at times, especially after prolonged mental exertion, he can bear but a very mild current through the mastoid region, say $1\frac{1}{2}$ ma., or longitudinally, without considerable pain being experienced. He is subject to sudden attacks of epistaxis, which afford more or less relief. Now while this patient cannot bear the moderate currents alluded to, when comparatively small electrodes are used, yet with a positive helmet covering the entire head, 20 ma. may be given with comfort and benefit, the negative being at the feet.

The use of the static spark in diagnosis, is at times essential. When a nerve will not respond to either the galvanic or faradic current, it will sometimes do so to the static spark, thus showing a continuity, not otherwise demonstrated. The reason for this is, that the franklinic current possesses such an enormous voltage, which penetrates deeply, affecting areas that the other currents fail to sufficiently stimulate. Obviously this current is not available for use about the

head, in diagnosis, but must be confined to the trunk or limbs.

The reactions of the auditory nerve to the galvanic current, as formulated by Brenner, are painful to produce, and few patients will be found, who are willing to submit to them. I seldom attempt them. In some cases of tinnitus aurium, the tinnitus will subside entirely during the passage of a mild current through the auditory nerve, and in such patients I give a very favorable prognosis.

The effect of the electric current upon sensory nerves differs from that upon motor nerves, in that the sensory nerves are stimulated by a continuous flow of either current. With the galvanic, a sensation is felt with a weaker current with ca. cl., an. cl., and an. o., than with a continuous flow, in this respect behaving precisely as do the motor nerves.

RECAPITULATION.

When a lesion is in the cord, above the dorso-enlargement, as in some forms of transverse myelitis, all the nerve and muscle reactions will be normal, for the parts below the trophic centre, except that possibly there may be some increase in readiness of response to electro-stimulation. If the lesion involves the dorso-enlargement, of course there would be the reactions of degeneration.

If the lesion be in the basal ganglia, or in the hemispheres above, there will be no change in the normal formula, unless the disease, in its progress, produces changes in the cord, thus affecting peripheral nerves.

In a hemiplegia, the result of a clot in the corpus striatum, there will be no change in the reactions, except that in some cases, the muscles respond more readily than the normal muscles, to both currents. In other cases, the reactions are simply normal, but in still other cases, there may be a quantitative decline, due merely to the degenerative changes in nerve and muscle.

In uncomplicated lateral sclerosis, the reactions are all normal. I have a case of lateral sclerosis under my care, of eight years standing, and specific in origin, which, when first tested, some six months ago, showed partial reaction of degeneration, but now the normal formula has been re-established.

In amyotrophic lateral sclerosis, there will be both qualitative and quantitative changes in the muscles, or partial reaction of degeneration.

In anterior poliomyelitis, infantile paralysis, and lead palsy, we have the reaction of degeneration.

It will also be found in peripheral paralysis of traumatic, rheumatic, neuritic or diphtheritic origin. It is absent in all cerebral, hysterical, myelitic and purely myopathic paralyses.

In cases where the reaction of degeneration is

limited to a definite peripheral neuro-muscular area, the probabilities are in favor of the diagnosis of a peripheral lesion. When the phenomena of R. D. are observed over a larger area, a central (spinal) origin of the paralysis is rendered probable.

In light forms of rheumatic, traumatic, or pressure paralysis, the reactions will all be normal. In the middle form of these affections, qualitative and quantitative changes appear, and there is partial reaction of degeneration. When the severe form appears, we then have complete reaction of degeneration, or the normal formula completely reversed.

In muscular wasting, or simple atrophy, such as in phthisis, etc.; in diseases of the joints, and in idiopathic myositis, the reactions are normal, or the diminution is to the maximum of excitation.

By quantitative changes, is meant an increase, a diminution, or a total disappearance of electrical irritability to one or both currents.

By qualitative changes, are meant a modification in kind, of the normal reactions of nerve and muscle, to electric currents. This is the so-called "reaction of degeneration."

There is a third, or a mixed change, or a combination of quantitative and qualitative variations of irritability.¹

The histological changes shown in the preceding table, explains the phenomena of the reaction of degeneration. There is a solution of continuity, and a consequent inability to transmit impressions. Gessler, in his researches upon cold-blooded animals, seemed to prove that true R. D. was entirely due to muscular degeneration, as, while in these animals complete nerve degeneration occurred, muscular degeneration as well as R. D. were absent.

There is much yet to be learned regarding brain diagnosis, and I hope at some future time to present the result of some investigations that I am making in this direction.

2005 Arch St., Philadelphia.

SOCIETY PROCEEDINGS.

Medico-Legal Society of Chicago.

Mr. President and Gentlemen of the Society: Instead of presenting the clinical symptoms of acute arsenical poisoning in the abstract, I have thought a brief description of the symptoms, as observed by myself and others in a series of cases, would be more profitable, and, perhaps, more interesting. By the kindness of Dr. J. E. De Wolf, of Englewood, Dr. Chas. J. Simons and Dr. J. S. Knox, I am able to present the following series of cases:

¹ Bibliography: Liebig and Rohé, Ranney, Adams, Cleavinger, Erb, De Waiteville, Bartholow.

THE CLINICAL ASPECTS OF ACUTE ARSENICAL POISONING.

Presented before the Medico-Legal Society of Chicago, Oct. 3, 1891.

By DANIEL T. NELSON, M.D., of Chicago.

The Newland cases you are familiar with in a general way, where the servant girl poisoned an entire family in Englewood. Dr. De Wolf writes me a few notes from memory, as follows:

I responded about 8 o'clock P.M., in April, 1890, to an order coming from the Newland family at about 7 P.M. The entire family, consisting of four members, were sick; the father and mother were in bed. The son, a young man who was out looking for help, soon came in, telling me he had been vomiting freely on the street, and he, too, was obliged to lie down. The daughter, a young lady, was able to be on her feet at this hour, and had not, I think, vomited, although feeling some discomfort in her stomach and bowels. The father and mother had been for half an hour, and still continued, vomiting freely, and complained of pains in the stomach and bowels, and also of dryness of the throat. They seemed not inclined, or not able, to give any explanation of their condition, but learning that they had all sat down together at supper at the usual hour (6 or 6:30) and in their usual happy mood, and finding them thus prostrated, I suspected poisoning, although I could not think it intentional, as it was the first meal prepared by a newly arrived domestic; but learning that she had not eaten with the family, and was missing from the house, added to my fears. Before these facts could be gleaned some time had passed; emetics had been given, and emesis was followed by the free exhibition of demulcent liquids. The symptoms at this point were chiefly those of intense gastro enteritis, but superadded to these came some evidence of arsenical poisoning. In Mr. Newland's case the abdomen became swollen and tender, while the skin was pale and cold, with a clammy sweat, the pulse frequent, small and irregular, the respiration labored, with frequent cramping of the extremities. Mrs. Newland's case differed from that of her husband in that there was a hot and dry skin, with but little if any cramping of the limbs, and with some tendency to delirium, or at least to marked stupor. The other two members of the family presented the same symptoms, but in a less marked degree. In each case anodynes for the relief of pain were given, and the hydrated sesquioxide of iron was given as an antidote to the arsenical poisoning which was suspected.

Two hours after my arrival, Dr. D. T. Nelson was asked for his council, and agreed with me that there seemed to be no need of the stomach pump, as emesis had been so thoroughly effected.

Mr. Newman died about five o'clock of the following morning, and Mrs. Newman at noon of

the following day, while the others made a good recovery within a week.

The form of poison used was a kind of arsenical paste, which is called "Rough on Rats," that the servant procured from a neighboring drug store. According to her statement, she put it into the corn, probably after it was cooked. I think no remains of the package could be found. The corn, as I recollect it, was the only dish that was partaken of by all of the family.

From Dr. Simons I was fortunately able to gather a series of cases.

Case 1.—A girl, 18 years old, on account of a love affair, attempted to commit suicide by taking Fowler's solution at bedtime. Dr. Simons saw her within an hour. There were some cramps in the abdomen, with thirst and dryness of the throat. There was purging (but he thinks not from the emetic, which was tartarized antimony) and bloody stools. Hydrate sesquioxide of iron was given as an antidote after the vomiting. She recovered after a week's illness. There was no paralysis.

Case 2.—A family named Fritz; the man was a laborer. There were five in the family, father, mother, and three children from three to ten years old. White arsenic was taken in coffee. They lived in a house by themselves. The family was seen about the house as usual in the evening, and the next morning they did not show any signs of life. The neighbors became alarmed about seven or eight o'clock in the morning, and began to investigate, and found the family all sick. They lived near 18th and Arnold streets, where the County Hospital was then located. Dr. Pitcher, who was county physician at that time, was summoned, but he was not at home, and Dr. Simons was called in. He reached the family about 9 o'clock in the morning, and they were supposed to have taken the poisoned coffee about bedtime, or in the early night, so that it was about twelve hours after taking the poison before the event was known. The mother and two children were dead, but the father and youngest child were still alive. Here arises an interesting question: Why was the father and the babe, which was about three years old, alive? Was it because they had taken a less quantity, or vomited more, or were stronger to resist the poison? The father was not a drinking man. He vomited arsenic, and arsenic was found in his stomach and that of all the others. He was taken as soon as possible to the County Hospital, and his stomach washed out with a pump. He lived two hours. The baby died within two or three hours. When Dr. Simons reached the house, about 9 o'clock, the father was unconscious, but he became conscious before he died. He would not tell who gave him the poison, whether the mother gave it to the whole family, or whether there was an agree-

ent between the father and mother; no one ever found out what arrangement was made. The father had severe diarrhœa and cramps, and suffered greatly. The child vomited without an emetic, and also had severe diarrhœa and cramps. No antidote was given because it could not be allowed.

Case 3.—A servant girl 23 years old. She had lived with this family some five or six weeks and had always seemed peculiar. She ate Paris green or Scheele's green. She stirred it up with water and drank it, smearing her mouth, her face, her hands, the cup in which she mixed it and the shelf on which it lay. She vomited matter showed what the substance was. Dr. Commons was called in about fifteen minutes after she took it and gave her an emetic; she had vomited previously from the arsenic. There was vomiting but no cramps. In an hour or two she was taken to Michael Reese Hospital and the subsequent history is not known. She vomited freely the eggs and other demulcents which had been given to her. The stomach was washed out in the hospital but no antidote was given.

Dr. Knox writes me as follows: In 1872, while suffering from neuralgia of the heart, I took through the error of the druggist, one dose of ten teaspoonfuls of Fowler's solution, equal to one grain of arsenious acid. About two hours afterwards I had constriction of the fauces, intense burning pain of the stomach, severe colicky pains in the bowels, and subsequently vomiting and dysenteric diarrhœa.

The cause of the poisoning was suspected and I was promptly treated with tablespoonful doses of moist hydrated sesquioxide of iron every fifteen minutes. There was relief in a few hours and no subsequent ill results.

The symptoms as you gather them up, of cold seats, pinched appearance of the countenance, cold, clammy extremities, and small, rapid pulse are perhaps as marked a series of symptoms as I have, and yet it might be questioned whether these were entirely and positively pathognomonic. Some of these symptoms we get in corrosive sublimate poisoning; the severe bloody vomiting and cramps. You do not get so much, perhaps, of the colicky pains in the bowels, you do not perhaps get such very marked evidence of shock, but yet you will see it. In the only case I have seen of corrosive sublimate poisoning there was the marked evidence of shock.

Perhaps it will be no credit to myself if I say that I supposed I was poisoned by arsenic while in college. I was working over some small test tubes with the blowpipe, blowing them out with my mouth, and I supposed I had taken some arsenic into my mouth and throat. Not knowing exactly how much it took to produce poisonous effects, I became frightened. I grew pale, had rapid pulse and thought I had pains in my

stomach and bowels, but did not vomit. I was getting ready to take some antidote when my classmate suggested that perhaps it was not arsenic, that he was working with zinc and he thought I was. I soon recovered when I found it was zinc.

The only other case I know of personally was chronic poisoning in which there was extreme weakness amounting almost to paralysis. At first there was ability to walk for months, finally ability to walk with two canes, gradually with one and then without any. It was the case of a celebrated Boston physician, whose name you are doubtless familiar with, Dr. Bumstead, a man who has been celebrated for years as an author of venereal diseases. He was poisoned apparently by arsenic, as he supposed from wall paper.

Perhaps I need not speak of some very self-evident things, that Fowler's solution is perhaps the worst form of the poison to take; being in solution it is rapidly absorbed and not easily thrown off by emetics or otherwise, or reached by antidotes. In some regions it is a common domestic remedy, and known as the "ague drop," and is liable to be used as a poison accidentally, if not intentionally. Fortunately the odor of lavender gives it a specific and peculiar odor so that it may be detected, and if vomited the odor will lead the physician to suspect what he has to deal with.

Another question might be raised, and I suggest it for your discussion: Whether there is arsenic enough discharged from smelter chimneys to be of injury to persons, animals or foliage. You will sometimes notice from the smelter works at 40th street and Armour avenue, the peculiar sweet odor of arsenic. In looking over some books, I noticed that some one had prescribed Fowler's solution in two teaspoon doses for snake bite, and had been very successful in making the patient vomit. The doses were given every half hour until the patient was relieved. I was wondering which was most likely to kill, the snake bite or the remedy, but the patient is reported to have rapidly recovered, so we suspect the Fowler's solution was thrown off by the vomiting.

One of the patients you notice was said to be comatose; the question where the coma comes from is interesting. In some cases bloody albuminous urine is reported. Is the coma the effect of the poison on the kidneys? Is it uremic coma?

I did not intend this to be anything like a full presentation of "the clinical aspects," but I thought as I was able to gather together some of these cases, if I could get something of a series, it would be perhaps more interesting. I have not touched upon the treatment, as I thought that belonged to another department.

SPONTANEOUS RECOVERY IN ACUTE ARSENICAL POISONING.

Read before the Medico-Legal Society of Chicago, October 3, 1891.

BY HAROLD N. MOYER, M.D.

Almost every poisonous substance is characterized by some fairly pathognomonic symptoms, with the exception of arsenic. It belongs to the class of intestinal irritants, the symptoms of which may be closely imitated by any simple inflammation of these parts. We lack the characteristic symptoms presented by opium, belladonna or strychnia, so that a certain diagnosis of arsenical poisoning is difficult or impossible without the aid of a chemical analysis. The symptoms and pathological appearances in acute arsenical poisoning are fairly constant, and yet there is an occasional case in which there is such a wide divergence from the typical picture that there is great liability to error. With these uncertainties clearly before us, we should be very careful in advancing a dogmatic opinion.

The average fatal dose of arsenic is well known, but the literature of medicine contains many cases where spontaneous recovery has taken place after the ingestion of a quantity many times greater than a dose that commonly proves fatal. It is apparent that the factors governing these cases are exceedingly various. The resistance of the patient may be greater than usual; a dose, granting that it is all absorbed, may be eliminated in one case, that in another would prove fatal. Again, the rate of absorption may vary. If the arsenical preparation is relatively insoluble, it may be so long in entering the circulation that the greater portion is either vomited, or passed off by the bowels in consequence of the violent peristalsis produced by the drug. As a matter of fact, it is only exceptional that recovery takes place when these violent symptoms are present. Recovery has, however, been noted after the taking of enormous quantities. Tidy refers most of these cases to that class in which the poison is taken upon a full stomach. As a consequence, the great bulk of the drug is rejected with the food in the first efforts at vomiting. It is probable that this is the explanation in most of the cases where spontaneous recovery has taken place after exceptionally large doses. It would be hazardous to deny the possibility of spontaneous recovery even when the arsenic has been administered upon an empty stomach, but we may at least say that it is highly improbable. Any one who has ever examined a stomach containing a considerable quantity of arsenic, must have noticed the closeness with which the powder adheres to the mucous lining of the organ. The healthy empty stomach always contains a small quantity of mucus, and this serves to glue the powder to the stomach walls, so that with violent vomiting it is gotten rid of with difficulty, or not at all.

The following case is one of peculiar interest, and is, so far as I know, the first time the question of spontaneous recovery from arsenic has been directly raised in a court of law.

The facts are briefly as follows: A man was charged with the attempted murder of his child, the motive alleged being a desire to inherit considerable property belonging to the latter. The testimony brought out at the trial showed that the child was $3\frac{1}{2}$ years of age, and that it had always been of delicate health. The night preceding the alleged poisoning, the child was taken vomiting shortly after eating a hearty supper. A physician was called in, and made a diagnosis of dyspepsia and bronchitis. The boy vomited once or twice during the night. At 15 or 30 minutes after 6 the following morning the father gave him a drink of water, in which it was supposed he had placed the poison. At 15 minutes after 7 a woman who had charge of the boy came into the room to dress him. He then complained of feeling ill and began to vomit. The nurse noticed that the tongue was covered with a thick green coat; the vomited matter was also mixed with a greenish substance that stained the towel upon which they were caught. A subsequent examination of these cloths showed the greenish matter to be Paris green, the quantity recovered amounting in all to about 2 grs. (Regarding the quantity of Paris green, there is a discrepancy between the testimony of the physicians who examined the towels and the chemist who made the tests. The former say that at least $\frac{1}{2}$ teaspoonful would be required to produce the amount of staining which they saw. We may disregard this, however, as the smallest quantity stated, 2 grs., is amply sufficient to cause death in a child $3\frac{1}{2}$ years old.) A servant also noted and testified that the child vomited greenish substance. As soon as the vomiting began a physician was summoned, who reached the house at 8:15 A.M. On the strength of the statements made to him he prescribed an antidote and an emetic, the latter acting freely. This physician refused on the stand to state that he believed the symptoms were due to arsenic poisoning, as he thought they were too mild. A second physician, who saw the child at 10:30 the same morning, also refused to state that in his opinion the illness was caused by arsenical poisoning. After the effects of the emetics passed off, there was no special disturbance of the child's health, no vomiting, purging, inflammation or prostration.

Certain facts in the above account show that this case is one that must be classed among the spontaneous recoveries, granting that a fatal dose of arsenic had been administered as alleged. It must also be placed among the unusual ones, as the poison was given on an empty stomach. At least three-fourths of an hour elapsed from the

test time when the poison could possibly have been administered before the child began to vomit, then he was given some milk and he vomited again. One hour later a physician arrived and administered an emetic, but at this time no greenish matters were discharged.

The question naturally presents itself, and it is as one upon which we were asked for an opinion, "Was the Paris green administered as alleged?" If we assume that it was given, then we affirm the possibility of recovery upon an empty stomach, and without the use of antidote or emetic. Granting this possibility, the additional fact presents itself, in this case, that the child was not ill after this severe dose of arsenic. Assuming that the vomiting was caused by the poison, sufficient must have been absorbed to cause marked irritation of the stomach. Is this possible in view of the fact that there was no vomiting, inflammation or prostration three hours after the administration? Beck mentions a case of spontaneous recovery after Paris green poisoning in a young boy. Recovery took place only after a prolonged illness, with severe prostration. It is a general experience that recovery after acute arsenical poisoning, if sufficient time has elapsed for vomiting to have occurred from action of the drug, is exceedingly slow. The patient is often prostrated for days, and sometimes death takes place long after the administration of the full dose.

In view of the very great uncertainty that surrounds the subject of acute arsenical poisoning, we can hardly deny that arsenic was administered in this case, and yet a careful consideration of all the facts throws at least a reasonable doubt on the testimony. An opinion was accordingly given that, while the facts as brought out in the testimony were not inherently impossible, they were in a high degree exceptional.

A very ingenious explanation was offered by one of the medical witnesses. He would account for the spontaneous recovery on the theory that, as the child was suffering from bronchitis, it must have swallowed a considerable quantity of mucus during the night. This he thought would act in much the same way as a quantity of food in delaying absorption of the poison.

4 W. Adams St.

CHEMICAL CONSIDERATION IN POISONING.

Presented before the Medico-Legal Society of Chicago, Oct. 3, 1891.
by C. D. WESCOTT, M.D.

I am very sorry, as I know you all are, that Dr. Haines cannot be present to-night. From a little talk we had late last evening, I know that he would have contributed some very interesting matter, although he had been unable, from lack of time, to prepare a paper or even an abstract. However, he asked me to bring up one or two points which his experience has brought to mind.

One of these points has already been raised by Dr. Hektoen, that is, the fact that the embalming fluids in common use by undertakers often interfere with the detection and punishment of crime. Professor Haines has been engaged as chemical expert in at least five cases where there seemed to be abundant evidence of murder by arsenical poisoning, in which the fact of arsenical fluids having been used in embalming made it impossible to convict. And in another case, an innocent person came very near going to the penitentiary because of the accidental contamination of a stomach contents by arsenic from an embalming fluid. It may be well for me to recite the principal details of some of these cases.

In one case a man had made a will, bequeathing his wife a certain portion of his property; he determined to change the will, and in such a manner that she would be a hundred thousand dollars worse off; and so announced to her. There seemed to be abundant evidence to convict her of poisoning her husband with arsenic. Organs from the body of the man were submitted to Professor Haines for analysis and he found arsenic in the liver, stomach and contents of the stomach. And when these facts were brought before the woman and she was asked to plead guilty, she boasted that they would cut no figure, that she herself had ordered the undertaker to embalm the body and put all sorts of chemicals in it.

In another case, a maiden lady was found dead in the house of some people with whom she was living. It was learned that she had made a will bequeathing certain property to these people and that they had become aware that she intended to change the will to their disadvantage. Arsenical poisoning was suspected, and Professor Haines found in the stomach contents traces of arsenic. The stomach as an organ was not submitted. For some reason the body was re-examined and it was found that the stomach had been carefully washed out and that the abdominal cavity contained fluid; it was learned that the undertaker had been there in the meantime and put embalming fluid into the abdominal cavity, which upon examination was found to be arsenical. There was evidence to show that the people in the house had opened the body and washed out the stomach clean, still these people were not convicted of the crime because it could not be proven that the arsenic which Professor Haines had found in the stomach, was administered to the patient before death, because of the presence of the embalming fluid.

There is a very interesting chemical fact in connection with the other case in which an innocent party came near being punished. A woman suddenly died and somebody suspected that the husband had committed murder. There were some symptoms of arsenical poisoning, and the

stomach and other organs were submitted to Professor Haines for examination. A very small quantity of arsenic was found in the stomach contents, but Professor Haines had a feeling that it was not a case of arsenic poisoning, and he questioned the Doctor very carefully as to the possibility of any contamination of the stomach by arsenical fluid. The Doctor insisted that it was impossible. To make a long story short, it was found that the Doctor, when he removed the stomach contents, had asked the undertaker at whose place the body lay, for some sort of jar to put these contents into. The undertaker gave him a jar which he said had contained sulphate of zinc and nothing else; it was washed in a dark room several times with running water and was supposed to be clean. But it was afterwards ascertained that after the jar had been emptied of sulphate of zinc some arsenical embalming fluid remained in it for a short time. The interesting chemical fact in this connection is that although this jar had been thoroughly washed with water it did contain a little arsenic which had contaminated the contents of the stomach. To demonstrate how this was possible, Professor Haines experimented by securing some of the undertaker's embalming fluid and allowing it to stand a short time in a jar, when the characteristic crystal of arsenious oxide gathered around the sides. The fluid was poured off and it was shown that water could be repeatedly poured in and out of the jar without dislodging the arsenic.

As has already been mentioned this evening, there should be some legislation in regard to this matter of embalming fluids. Arsenical fluids are not necessary, in fact it is not necessary to embalm bodies with any substance which is a common poison, or which occurs commonly in suicidal cases or in murders. A mixture of alcohol, glycerine and water has long been used at Rush Medical College for preserving bodies for the purpose of dissection, and it has been found very efficient. Very few people suicide with alcohol, and no one has been murdered with alcohol to my knowledge; such a fluid therefore would not interfere with the detection of crime. If salicylic acid were added to this mixture, it would be even more effective and no less desirable as an embalming fluid.

Another point which Professor Haines suggested is that there is no absolute test for arsenic, that is no single test, and I personally know that Prof. Haines never testifies against a man accused of murder by arsenic without testing and re-testing by the various established methods, and told me last night that now he never makes an examination in a case of poisoning without at the same time carrying on a blank test, even going so far as to use an organ from a recently killed animal or from a deadhouse, such as he is examining for poison. It is not enough that he

uses chemicals which he is sure are absolutely pure, it is not enough that he keeps those chemicals constantly under seal in his laboratory, but even though he is sure he has pure chemicals and clean utensils, he makes these parallel tests in all cases. This illustrates the fact spoken of by Dr. Hektoen, that only the most careful and competent persons should be entrusted with such examinations. Only men of such care and skill and conscience should give such evidence in such cases. It should be illegal to use any poisonous embalming fluid, and I hope this Society will take some action in regard to the matter with a view to securing legislation on this point.

Another point I would suggest is, that in spite of the great number of cases of arsenical poisoning, it is a wonder there are not more, because of the universal distribution of arsenic in a great many forms and the ease with which it can be obtained. The common flypaper used in so many houses, the black paper placed in dishes of water is impregnated with arsenic, and cases of poisoning have occasionally been reported of children drinking this water.

(To be concluded.)

THE MORPHOLOGY OF BREAST MILK AND THE NUTRITION OF THE CHILD.—(Ivanoff. Thèse de Saint Petersburg, 1890.) An extensive study of this subject leads the author to the following conclusions:

1. The cellules of colostrum are of epithelial origin.
2. In multiparæ colostrum changes to milk more rapidly than in primiparæ.
3. Puerperal diseases retard the disappearance of the colostrum corpuscles.
4. These corpuscles reappear in the milk after ten months of lactation, and when the infant is only partially fed from the breast.
5. The free hyaline corpuscles, as well as those which are enclosed in the fatty globules, form a constituent of normal milk at a certain period of secretion.
6. Good health, good nutrition, and youth in the mother give a milk richest in fatty globules of large size as is also true of the cellules.
7. The last portion of milk taken at a feeding holds fewer globules, and these of smaller size, than the first portions.
8. The estimation of the nutritive quality of milk should be based upon the number of fatty globules; and secondarily, upon their size, the quantity of cellular element, and, finally, upon the quantity of granules.
9. Milk which contains a very large number of fatty globules (more than $3\frac{1}{2}$ per cent.) is not well borne by very young infants.
10. Milk, the globules of which are large, is less nutritive and less well borne.
11. The maximum of daily increase of weight of the child is produced by milk which contains a medium quantity of fatty globules of medium size (27.7 grams daily).
12. The milk which contains few fatty globules gives little increase of weight (16 grams daily); and the same is true if the fatty globules are in too great quantity and are too large (19 grams daily).
13. Women who are thin and young in general are the poorest nurses, often making the children dyspeptic, giving them a mean daily increase of weight of only 11.5 grams.—*Annals of Gynecology and Pædiatry.*

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information the weekly JOURNAL of the Association will be forwarded
regularly.

SATURDAY, NOVEMBER 14, 1891.

THE GASTRIC JUICE IN BRIGHT'S DISEASE.
BIERNATSKI has recently investigated the gas-
tric juice in Bright's disease, by the modern
methods of research, and reported his results in
Practitioner (1891, Nos. 12, 18, and 21), of which
La Province Médicale, October 10, 1891, gives an
abstract. He selected twenty-five cases of Bright's
disease, uncomplicated by disease of other or-
gans, and particularly those cases which had not
presented any digestive troubles, and which were
not ascitic. The cases were all in the earlier
stages, oliguria and œdema having been present
only one, two or three weeks, and in age were
between 25 and 40, with a few over 50. He gave
normal meals, and determined the HCL qualitatively
by the GUNZBERG test, and quantitatively by the
SÖEQUIST method. The biuret reaction was used
for peptones, UFFELMANN'S test for lactic acid,
and the total acidity determined by decinormal
solution of soda. The peptic power was deter-
mined by artificial digestion of albumen cubes,
and the lab-ferment and lab-zymogen investiga-
ted by the methods of KLEMPERER and BOAS.
From this it will be seen that his methods
were sufficiently complete to make his results
valuable.
From his observations this general result was
obtained: *The intensity and duration of the gas-
tric secretion are diminished in nephritis.*

There were always great variations in the
quantity of free hydrochloric acid, which was
more or less diminished or entirely absent. Af-
ter the EWALD trial meal the free HCL was rarely
more than 0.02 per cent. to 0.04 per cent. The
total acidity, however, was frequently above nor-
mal, notwithstanding the diminished amount of
HCL. While peptonization always occurred, it
was always slow or incomplete, notwithstanding
the addition of free hydrochloric acid to the gas-
tric juice. The lab-ferment and lab-zymogen
were always deficient, and lactic acid was never
present in large quantities.

The quantity of free HCL present is usually, if
not always, below normal, but it is subject to
great variations. A very direct relation seems
to exist between the renal secretion, and the se-
cretion of hydrochloric acid. Oliguria and œde-
ma diminish the secretion of hydrochloric acid.
In acute nephritis the secretion of hydrochloric
acid very quickly returns to normal when the
renal symptoms disappear, but in chronic nephri-
tis the acid secretion does not reach a normal
amount as long as there is albumen in the urine,
even after the disappearance of œdema and oli-
guria.

In general, it was found that the longer the
disease had continued, the more marked was the
disturbance of the gastric secretion. The influ-
ence of uræmia was studied only in mild cases,
and these showed a diminution in the hydro-
chloric acid secretion, greater than could be
accounted for by the oliguria or œdema present,
or by the duration of the disease.

From the foregoing, it may be inferred that a
diminution in the secretion of hydrochloric acid
occurs in renal incompetence, and is proportioned
to the degree of the renal incompetence.

It is to be regretted that BIERNATSKI did not
determine the relation of hydrochloric acid secre-
tion to urea excretion, and thus bring his work
into closer relation with that of DR. BOND, of
Richmond, Ind.

It was found that the secretion of pepsin did
not bear as direct a relation to the variations in
the renal disorder as did the secretion of hydro-
chloric acid. In general it was found that the
complete absence of pepsin is more frequent in
nephritis, either acute or chronic, than the com-
plete absence of free hydrochloric acid. This
last observation is particularly valuable when it

is borne in mind that direct investigation of the stomach contents has shown that in the great majority of primary dyspepsias, the peptic strength of the gastric juice is not impaired.

Notwithstanding the diminished amount of gastric secretion, very slight evidences were found of any abnormal fermentations occurring in the stomach, which is due, according to the author, to the unimpaired mobility of the stomach.

The causes of the gastric disorders in nephritis are certainly complex, but it is probable, as the author suggests, that one of the factors concerned is the depressing effects upon the gastric mucosa of the waste products which have failed of elimination by the kidneys. Under these circumstances the gastric mucous membranes may possibly assume an excretory rôle. Poisons passed in this way, which would at first cause functional disturbances, would in time lead to the production of anatomical lesions, particularly atrophy and fatty or amyloid degeneration of the mucosa.

The changed chemical composition of the blood is no doubt another factor in the modification of the gastric secretion. BIERNATSKI attributes the origin of pepsin to the albumen of the blood, and holds the hypo-albuminosis of this fluid responsible for the diminished secretion of pepsin. This latter statement can hardly be accepted without great reservations.

By way of treatment the author suggests the use of peptonized milk, and the administration of lime salts, because of the absence of lab-ferment. Hydrochloric acid lemonade diminishes the unpleasant sensations of the patients, and at the same time regulates the alvine evacuations by stimulating peristalsis. Moreover the hydrochloric acid diminishes the intestinal putrefaction, which is singularly exaggerated in this disease, as the author has shown by urinary examinations.

DELIRIUM IN PNEUMONIA.

A recent observation by CASTELAIN (*Archives Médicales belges*) seems worthy of some attention. His observations relate to the delirium which commences just before the crisis, and lasts for several days thereafter. While not ignoring general conditions, alcoholism, debility, the con-

dition of the heart, and circulation, of the brain, and nervous system, of the kidneys, and other organs, he has directed especial attention to the condition in the lungs. During the period of complete hepatization, the lung is impermeable to air; the exudation is abundant but coagulated and compact; the alveoli are filled with fibrine, and young cells, mixed with red corpuscles. Next comes the period of liquefaction, and absorption of the great mass of the liquefied products.

CASTELAIN's observations at this period of the disease, lead him to the following conclusions:

1. The appearance of the delirium coincides with the beginning of the period of liquefaction, and is its first indication.

2. The curve of the delirium is parallel with the curve of liquefaction, and of the abundance of the exudation. The delirium increases during and after defervescence of the fever, in proportion as the râles become more moist and more numerous, and as they extend over a greater area. The delirium diminishes and disappears, little by little, in proportion as the fine râles become less numerous, occupy a less extensive area, and give place to coarser râles and finally to dry râles.

3. The duration of the delirium is in relation with that of the liquefaction of the great mass of the exudate. If the latter is liquefied rapidly and disappears immediately from the alveoli, the delirium is of short duration, but is more violent than when resolution occurs slowly or in different regions in succession. Delirium may even be entirely absent when liquefaction is slow, or the exudation slight.

THE NON-PERMANENCE OF INEBRIETY CURES EXEMPLIFIED.

The sad death of "FELIX OLDBOY," a literateur of New York City, lately, and a warm defender of the KEELEY "bichloride of gold" cure, is reported. He died from alcoholism in the workhouse on Blackwell's Island. He has only recently been represented in the *North American Review* by a long article setting forth the marvellous effects of KEELEY's system in his own person and some other very obstinate cases. These cases were strenuously held to be "permanent" cures, but the ink could scarcely have

men dry on the pages of the *Review* before his first lapse into drunkenness took place. So far as this case is concerned, the KEELEY "cure" was worse than a broken reed to lean upon, since this unfortunate inebriate was induced to ignore and despise the more legitimate measures of relief. The glamour of a false "permanence" misled him, and has probably hastened his final and fatal lapse. This is not said as being peculiar to the KEELEY cure. It is equally pertinent to every other quackish claim to "permanence" in the treatment of the dipsetic propensity. It is not in the resources of chemistry, we hold, or in the pharmacy of the vegetal kingdom, to produce specifics of that nature. The true secret of KEELEY, and every other pretender of his class, who exert any prohibitive influence over the powers of toxicants, resides in the power of the mind—the superiority of will power—and can properly be included under the head of "mind-cure" masquerading in the garb of drug-treatment. In view of the above, what will be the prognosis in the case of KEELEY? His bubble has burst suddenly in the sight of the whole world, but his decline will not, therefore, or of necessity, be immediate. He may still continue to have a following, more or less noisy and enthusiastic, but his end draws nigh. We have seen just such cases as his, and the history of medicine tells of many others like him, and almost without exception this has been the rule: exposure of fraud eventually brings about its downfall, but it is seldom an immediate or a very rapid decline. Sometimes a fraud shows a considerable vitality, but this is not the rule, even when the true facts in the matter have been laid bare.

THE CHINESE FORM OF HIGH DILUTION TREATMENT.

The *North China Medical Journal* is responsible for the following paragraph about an infinitely small potential treatment employed at the apodes; it is not improperly called "The Brass Cure." That journal states that a traveler at Peking says "that he saw a method of cure which may be new to some of our readers. In a temple outside one of the city gates is to be found a brass mule of life size, supposed to have wonderful healing properties. Patients suffering

from every imaginable disease seek this temple to obtain a cure. The method pursued is as follows: Supposing you suffer from sciatica, you go with all speed to this famous temple, and having discovered the particular part of the brass mule corresponding to the painful region of your own body, you first rub the animal a certain number of times and then with the same hand shampoo your own disabled member, and then—well, then the pain goes. The special feature of this method of cure is its delightful simplicity. Is your tooth aching? Just scrub the mule's teeth and afterward your own, and, *voilà!* the cure is complete. Have you an ulcer of the cornea? Pass the tips of your fingers to and fro over the particular eyeball of the mule, and then with well-regulated pressure rub repeatedly the afflicted eye. The mule has unhappily lost his sight during the many years he has been engaged in his benevolent work, the eyeballs, we are told, having been gradually worn away as the result of constant friction, until now you have only the empty orbits to operate upon. The animal is patched in all directions with fresh pieces of brass put on to cover holes produced by the constant friction of eager patients, and a new, perfectly whole mule stands ready at hand awaiting the day when his old colleague, having fallen to pieces in the service, shall give him an opportunity of likewise benefiting posterity."

The reader of the above will recognize that there is in it a reminder of the *similia similibus* principle as well as that of minute dosage.

EDITORIAL NOTES.

THE KÖRÖSI PRIZE.—Dr. Joseph Körösi, of Budapest, has offered the sum of \$300 as a prize for the best essay on the objects of demography and its progress in the chief countries of Europe and America. The competition remains open until January 1, 1894. The award will be made at the opening meeting of the next International Congress of Hygiene and Demography, at Budapest in 1894. The essays may be in either the English, French, German or Italian languages.

THE PISTOJA POWDER REMEDY FOR RHEUMATISM AND GOUT.—A somewhat famous remedy in Italy for rheumatism and gout is the Pistoja powders, so called because sold formerly as a proprietary remedy by the monks of the town of

Pistoja. It is now no longer a secret medicine, thanks to the governmental regulations which at the present time forbid the sale of patent remedies, the composition of which has not been revealed to the proper officials. The formula of the Pistoja powder is said to be:

R. Colchicum corms, 2 parts.
Bryonia root, 1 part.
Betony, 5 parts.
Gentian, 1 part.
Chamomile flowers, 1 part.

To be finely pulverized. Mix. Dose at first not to exceed 10 grs.

The presence of colchicum explains why it is that untoward results have been experienced by the non-professional prescribing of this remedy, which was alleged by the monks to be harmless.

THE ANNALS OF HYGIENE for November has taken one of our five line items and given it the very appropriate title of "The Potency of Malnutrition," for which title we extend thanks. Although it was only put at the end of a page to fill space, it was editorial matter.

DOMESTIC CORRESPONDENCE.

LETTER FROM PHILADELPHIA.

The health of the community at the present time is very good. There was a report that diphtheria was prevailing in the western part of the city a few weeks ago, and pending an investigation, one of the public schools was ordered closed by the Board of Directors. It was found that there was an unusual number of cases of catarrhal sore-throat and tonsillitis—possibly an aftermath of the grippe, or due to weather-changes, but only one or two well-authenticated cases of diphtheria could be discovered. The school house was examined by Dr. J. Howard Taylor, physician of the City Board of Health, by whom it was declared to be in good sanitary condition; and it will, therefore, be re-opened at once.

The quality of the water-supply of Philadelphia has for some time been rather severely criticized in the public prints; but there is room for the suspicion that at least some of the advocates for better supply were not entirely disinterested in the matter; their plea was not so much for a better water supply as it was in favor of a certain specific plan, which if adopted would result in the expenditure of a large amount of money on the part of the city to the great pecuniary advantage of themselves or their clients. In spite of the obvious fact that the mortality-rate of Philadelphia is below that of other large cities, and the additional fact that the Schuylkill water has been repeatedly analyzed and pronounced good, even better in quality than the drinking water of New York, Boston and other American cities, the impression seems to have become general that Philadelphia

has a seriously polluted water-supply; whereas the truth is that special attention has been given this matter of late years by the city authorities; and since the construction of the intercepting sewer and the immense subsiding reservoirs in the East Park, and the abolition of some evident sources of contamination, the drinking water of the city has been not only abundant, but of very good quality. The City Councils have just received a report of a sub-committee, appointed to compile a statement from the reports, papers and documents of the Water Department, concerning the water supply of the city with a digest of their conclusions, acting with the Mayor and the Director of Public Works. The special object of the investigation was to obtain a well-matured decision as to the nature, character and cost of the system to be adopted in future, and incidentally to expose any defect or deficiencies in the present plan of supplying the city with water. The report is full and elaborate; and while it refrains from any definite recommendation, it declares very positively that there exists no necessity for the present generation to take into consideration any other source of supply than the Schuylkill river, as this is shown by all reports; the minimum flow, in case of the heaviest draught in any year, being 225,000,000 gallons in 24 hours, while the maximum over 4,500,000,000 gallons in the same time. It is advised, however, that action be taken at an early date to prevent useless waste. In regard to the purity of the water, the report claims that it has been clearly demonstrated that if water be taken from Flat-Rock dam, a point above Manayunk, the water will be purer, and the purity could be still more improved by obtaining the city's supply from the Norristown dam about fifteen miles from the city, the water being brought down by conduits. The statistics of the Water Bureau show that the water from these points is not surpassed in purity by that from any other site along the Schuylkill yet suggested. To make a greater improvement in the quality of the water will bring in the question of filtration, one of vital importance which cannot be ignored, and the argument is made that no permanent relief can be afforded without filtration facilities of the most approved character. This report is now before Council for discussion. A plan has already been adopted for locating a new reservoir for subsiding purposes near the Falls of Schuylkill, and it is probable that in its construction the recommendation of the Committee, with reference to a system of filtration, will be carried out.

The medical schools report progress. At the University of Pennsylvania, the Freshman class is larger than last year. The Faculty, having already a three year graded course, are now agitating for a fourth year to the medical department. Some time ago Professor Pepper announced that such an extension of the course would be made in time, but that an endowment of \$250,000 and a guarantee fund of \$20,000 per annum for five years would be necessary. Dr. Pepper offered, himself, \$100,000 toward the endowment and \$1,000 per annum toward the guarantee fund. The rest of the money necessary has not yet been obtained, although the subscription is progressing well, so that it is confidently expected that the new course will go into operation in the Fall of 1885.

Students who enter this year are allowed to choose the four year instead of the three year course, and some ten or twelve, thus far, have done so. The new School of Hygiene at the University of Pennsylvania, founded by the liberality of Mr. Henry C. Lea and others, will be opened about February 1st, 1892. The Laboratory building, in which it will be located, is rapidly nearing completion, and is already praised for its beauty and its ingenious construction. It is very clear that the course is to be eminently practical. Every part of the building is a hygienic object-lesson; all the most approved methods of heating, lighting, draining and ventilating are to be tested by actual use. One room has six varieties of steam radiators, arranged so that the efficiency of each, and others if necessary, can be known by accurate measurement. Another room exhibits three systems of ventilation. All sorts of traps and water-closets will be tested in the building. All pipes for drainage, hot and cold water, steam and gas, have everywhere been left bare; each system has its own color, so that it may be readily located. In many of the laboratory fittings, there are new features, especially adapted to the novel work to be done. The construction has been continually under the supervision of Dr. John S. Billings, who will be the Director of the School, and it appears certain that nothing which could add to the efficiency of the course has been omitted. Besides the course in Practical Hygiene, there will be an elementary course in bacteriology, commencing February 1, 1892; and an advanced course commencing April 2, each lasting eight weeks. These courses are intended to be practical and will include investigations of water, air and soil, the study of pathogenic bacteria, microscopic technique, culture media, protective inoculation and the preparation of vaccines, also details of disinfection, antisepsis, etc. Dr. A. C. Abbott, recent Assistant in Bacteriology and Hygiene in the Johns Hopkins Hospital in Baltimore, has been appointed First Assistant in the Laboratory of Hygiene, and applications for information or admission should be addressed to him at the University of Pennsylvania.

The Medico-Chirurgical Hospital during the summer has been remodeled. Two floors containing rooms for private patients have been added, and a new front of Pennsylvania granite, of appropriate and impressive design, has been built on the street-line. By these improvements, now approaching completion, the capacity of the hospital will be nearly doubled. The wards have been enlarged, private rooms added, and the structure changed from a four-story to a six-story building. The opening takes place with public ceremonies, on November 10. The Medico-Chirurgical College, both in its clinical and dental classes, reports good attendance, somewhat in excess of last year at the corresponding period. Prof. Ernest Laplace has a complete bacteriological and pathological course, with excellent facilities for instructing students in pathogenic bacterial culture and microscopic work.

The election of Dr. Jas. C. Wilson to the chair of Practice at the Jefferson has given general satisfaction to the faculty and students, who are also gratified by the arrangement by which Prof. Da Costa continues his medi-

cal clinics, although now only Emeritus Professor of Practice. Prof. Da Costa will also give his usual clinical lectures at the Pennsylvania Hospital this winter on Saturday mornings. In spite of the loss of Prof. Bartholow, and the uncertainty as to who would succeed Prof. Da Costa, the Dean of the College, Prof. Holland, states that the class is about 500, which is quite up to the average number for the last ten years. It may be stated that all our colleges now require evidences of preliminary preparation, and all have a compulsory three years' course. This, taken in connection with the previous statements about the size of the class at each of our schools, should prove to those colleges in other parts of the country, which are fearful of advancing their requirements, that the profession is ready to support them. In connection with the Jefferson, it is an open secret that committee meetings have been held lately, and much debate indulged in concerning ways and means, and details of site and construction for the contemplated new buildings; it being said that the most approved plan will locate the new structure on Broad street, south of Walnut.

So far, this has been by far the most prosperous year in the history of the Philadelphia Polyclinic. All the departments are active, the clinical material which is used in teaching is abundant and varied, and the classes are much larger than they have ever been. The branches to which students are most attracted are, of course, gynecology and general surgery; although the departments of clinical medicine, neurology, diseases of the chest, throat, nose, ear and skin, are all doing active work. During the current month fourteen laparotomies, and numerous other surgical operations, were performed in the hospital before the class. On October 9, Dr. Jackson removed a large ivory exostosis from the orbit. The growth had been noticed for about two years, increasing rather rapidly. The eyeball was pushed forward about 8 mm., and downward 10 mm., but binocular vision was maintained. The exostosis, which weighed $6\frac{1}{2}$ drachms, was removed by drilling holes in the base and breaking the intermediate bone. Its attachment was to the upper, inner wall of the orbit, and the frontal sinuses were opened by its removal. Healing was prompt and uncomplicated, and the sight of the eye was preserved, but there remained a diminishing paresis of the orbital muscles, and some ptosis. Various methods of attack were considered and tried, but the drill was the only instrument that made a satisfactory impression on the extremely hard osseous material of which the tumor was composed.

Dr. Frederick P. Henry, who has been one of the instructors at Jefferson, and was a candidate for the chair of Practice, has been elected to the corresponding chair in the faculty of the Woman's Medical College. Dr. Henry has been for years one of the attending physicians to the Philadelphia Hospital and to the Episcopal Hospital, and Professor of Clinical Medicine in the Polyclinic, and still retains these positions. He is an able pathologist and lecturer, and is a decided acquisition to the Woman's College.

A special meeting of the County Medical Society was

held just after the close of the recent Triennial Congress of Physicians and Surgeons at Washington, in honor of some of the foreign visitors who stopped over in Philadelphia for a brief rest, and to recover from mal de Washington, or Potomac quickstep, which during the late International Congress almost assumed the proportions of an epidemic, especially among the English members. The subject discussed at the special meeting of the County Medical was "Appendicitis." Papers were read by Dr. W. W. Keen, Dr. Joseph Price, and Dr. Thos. S. K. Morton, and a case was presented by Dr. Frank Woodbury, upon which an operation for excision of the appendix had been done by Dr. Thos. G. Morton, five years ago. The discussion was opened by Dr. Wm. Pepper, and was continued by De Forest Willard, Hare, Baldy and others. Mr. Thomas Bryant, of London, one of the guests, while favoring operation, urged the advisability of delay in operating in the majority of cases. Cases should be divided into those which are acute from the beginning, and which require prompt relief, and others, not acute, having a slow and steady progress. The latter begin with a localized pain in the right iliac fossa, accompanied with tenderness and soreness, and less swelling; and according to Mr. Bryant, these can be dealt with satisfactorily without the surgeon's knife. The line of treatment approved by Mr. Bryant would not be that recommended by Dr. Morton, of calomel and podophyllin in frequently repeated doses, but he would prefer to rely upon rest and diet, belladonna externally and opium internally, believing and knowing that by such means the bulk of the cases are permanently cured. In exceptional cases, where these good results do not follow, and graver symptoms, increase of swelling and symptoms of peritonitis, appear, the surgeon's aid becomes of immense value, and certainly where these symptoms do appear, and there is a steady progression toward the bad, it is unquestionably time for the surgeon to take a hand. In all acute cases he does not question the right of the surgeon to interfere. As regards the propriety of operation between the attacks, his judgment would oppose it. He had seen many cases, in which even after a second attack, things have settled down and no further trouble developed. He advised that each case should be considered as a law unto itself, and the surgical interference is obligatory only when we find small chances of nature terminating the case favorably when guided by medical skill. With regard to the operation, he preferred the lateral incision, in some instances as far back as the line of the anterior superior spinous process and tending backward toward the loin. He deprecated too much disturbance of the parts in searching for the appendix, believing that better results can be obtained by irrigation and treating the wound by the open method. In conclusion, he pointed out the fact that all cases of typhilitic trouble and abscess are not due to the appendix, as some may be caused by the ulceration of the cæcum or foreign body, such as a bone or orange seed, cases of which he cited. During the stay of the visitors they were well entertained. Dr. John B. Roberts, President of the County Medical Society, gave them a reception, at which were

present, Prof. Chiene, of Edinburgh, Dr. Wm. Gairdner, of Glasgow, and Sir William Mac Cormac, Mr. Thomas Bryant, Mr. Arthur Durham, Mr. Reginald Harrison, of London, to meet whom Dr. Roberts invited the members of the Society and physicians from other cities.

While speaking of societies, it is well to note that the gynecic imbroglio at the College of Physicians, which caused so much stir last spring and went so far as to cause the Board of Censors of the college to tender their resignations, has now been resolved and matters are now flowing in their accustomed peaceful channel. This was accomplished by the action of the college at its last meeting, when a resolution of censure was passed upon Dr. Joseph Price for expressing his private opinion of Dr. Penrose and other Fellows of the college somewhat too frankly, and the verdict of the censors that Dr. Price be requested to resign from the college was concurred in. It is understood that the censors have withdrawn their resignations, and Dr. Price shows no undue haste in offering his resignation, and probably will not do so at all. While the results of the commotion do not seem commensurate with the expenditure of force, or in other words, the amount of feeling that was stirred up, it is quite certain that the lesson will not be lost, and that the experience will be a salutary one in medical ethics, the good effects of which will be manifested hereafter.

The Pennsylvania Hospital will soon be enlarged; the managers having decided to erect another wing, which will add about 150 beds to its capacity. The new building will be upon the Spruce street front. It will be devoted to medical purposes and will have modern appliances for heating, ventilation, bathing, etc. The present buildings will probably be entirely surgical. The clinical hall will remain in its position between the present and the proposed buildings.

At his clinic, at the Pennsylvania Hospital, October 24, Dr. Thos. G. Morton exhibited the calvaria of a case of suicidal gun-shot wound of the brain. The young man was nineteen years of age, and was found in his room at a hotel with a bullet wound in his forehead, a little to the left of the median line. He was brought to the hospital at once, unconscious, and with right hemiplegia; he would occasionally lift his left hand to his head and grasp his hair as if in pain. Dr. Morton was out of the city at the time, and did not see him for two days. He found that a long probe could be passed directly through the left hemisphere until it met the parietal bone. Dr. Morton then trephined and found a softened collection as if the posterior convolutions had been churned up by the ball after it was checked by coming in contact with the inner table of the skull at this place. By inserting the tip of his little finger, he was enabled to detect the ball a short distance below the opening made by the trephine, and to subsequently remove it. The case was treated antiseptically, and a rubber drainage tube was passed directly through the brain along the track made by the bullet. The patient improved after the operation; he did not speak, but his eyes followed the movements of those about the room as if he were conscious. Three days later he died from exhaustion. Dr. Morton advocates the treatment of wounds of the

brain in the same manner as other wounds, by asepsis and drainage, and the use of the trephine if necessary to fulfill these objects. At the same clinic, Dr. Morton exhibited a calculus, cylindrical and tapering, resembling a thick date stone, which he had removed from the appendix vermiformis of a man, in the interval between attacks of appendicitis. The stone appeared to be phosphatic, and in drying became friable and easily separable into layers. The patient was also shown, having made a very prompt recovery. The operation was undertaken on account of the persistent tenderness remaining in the appendix region, and a hard object could be distinctly felt by deep palpation in this location.

At Jefferson Hospital, Dr. J. Solis-Cohen recently operated by Rouge's method for the removal of an epithelioma of the right middle turbinate body. The patient was a woman about sixty years of age. In this operation, the incision is made in the mucous membrane of the upper lip and the soft parts are separated successively from the bone and slid upwards so as to make a "death's head." The advantages are more freedom of access to the nasal chambers and absence of external cicatrix. The morbid growth, which was quite soft, was thoroughly scraped away and its base seared with the galvano-cautery.

A daily medical journal has commenced publication in Philadelphia, published by Dr. Jos. F. Edwards, the enterprising editor of the *Annals of Hygiene*. Subscription price, ten dollars per annum. The daily medical journal has frequently been discussed by medical editors and recognized as a long-felt want; but Dr. Edwards comes along and like a modern medical Columbus takes up the pullet's egg and smashing in the end, makes it stand alone and shows an admiring world how it may be done.

Section of Physiology and Dietetics.

To the Editor of the Journal of the American Medical Association:

Dear Sir:—The Section of Physiology and Dietetics should be a mirror of the present knowledge of the American Medical Association; those members who have any new points in physiology and dietetics will please send the titles of what they propose as their contributions to the common stock of knowledge. The officers of the Section could fill the whole time with papers and demonstrations, but this would infringe on others' rights and make it too much of an individual affair. There is no prescription of subjects, as this would be a restriction on the broad and open treatment that is due to workers in this department. Still practical points as to food will be very acceptable in the hope that better lays as to diet may sooner dawn.

By order of Chairman, C. H. Kleinschmidt, M.D.

Ephraim Cutter, M.D., Secretary.

The Ariston, 1730 Broadway, New York, Nov. 5, 1891.

Codeine and Narcine.

Ed. The Journal:—I have read with much interest Dr. B. Mattison's paper on Codeine and Narcine vice Morphia. I write this note to indorse with emphasis every word Dr. Mattison says in favor of codeine over morphia. I have used codeine daily for more than fifteen years to the entire exclusion of morphia, and never had any one to form the codeine habit, and never increase the dose.

I am sir, very truly,

CHAS. MANN.

BOOK REVIEWS.

DIAGNOSIS AND TREATMENT OF HÆMORRHOIDS AND OTHER NON-MALIGNANT RECTAL DISEASES. By W. P. AGNEW, M.D. Cloth, small 8vo, pp. 146. San Francisco: R. R. Patterson. 1891.

This book is principally devoted to recommendation of the treatment of hæmorrhoids by carbolic acid. The author's directions for making rectal examinations are excellent, and the author has given some valuable suggestions for treatment of these troublesome affections.

While the author's experience with carbolic acid is at variance with that of Andrews and others who have made a study of it, we cannot close our eyes to the fact that the "irregulars" are making the most of its use, and that there must be a much larger proportion of cures from it than is commonly supposed by the profession generally. It is really worth while to ask whether, in throwing away carbolic acid, we are not rather yielding to our disinclination to adopt anything from outside the professional pale.

We infer from frequent references to persons known to be "homœopathic," that our author belongs to that ilk, but nothing in the prescriptions, or the pathology, or the treatment, shows any heretical teaching of that sort, and we commend the book.

ESSENTIALS OF BACTERIOLOGY. By M. V. BELL, M.D.

This is one of Saunderson's Quiz Compendes, and one of the most useful of them. A small and comprehensive manual on bacteriological methods is a *sine qui non* to the student. This fulfills the demand.

OBSTETRICAL NURSING. By ANNA M. FULLERTON, M.D. P. Blakiston & Son, Philadelphia.

This little volume should have an extended sphere of usefulness. Detailed instruction on this subject is very essential to the prospective nurse who is attempting to grasp general principles simultaneously with practical matters gleaned from every-day experience.

MISCELLANY.

INTER-COUNTY MEDICAL SOCIETY.—The second regular meeting for the current year of the Inter-County Medical Society will be held at West Superior, Wis., in the parlors of the Broadway Hotel, Tuesday and Wednesday, November 10 and 11, 1891.

COMMITTEES.

Arrangements.—L. B. Shehan, Chairman; All Members at West Superior.

Practical Medicine.—J. B. Trowbridge, Chairman; S. L. Pickett, H. Hannum,

Surgery.—E. S. Hayes, Chairman; M. S. Hosmer, W. T. Rinehart.

Obs. and Dis. of Women and Children.—H. E. McIntyre, Chairman; H. V. Scallon, W. H. Ellis.

Special Gynecology.—J. V. R. Lyman, Chairman; A. E. Bonneville, C. V. Beebe.

New Remedies and Therapeutics.—D. H. Decker, Chairman; W. T. Leonard, W. C. Pease.

Elementary Branches.—F. W. Epley, Chairman; J. A. Rene, H. B. Weiper.

Finance and Publication.—J. B. Trowbridge, Chairman; C. A. Hayes, D. H. Decker.

PROGRAMME.

The following is a partial list of subjects to be presented and discussed:

Tumors in Unusual Places, by Dr. C. A. Wheaton, St. Paul.

Familiar Talk on Gynæcology, by A. J. Stone, St. Paul.

Enterocolitis, by C. S. Beck, Jr., West Superior.

Fractures of the Skull, by E. S. Bacon, West Superior.

Appendicitis, with Report of Two Unique Cases, by W. E. Ground, West Superior.

Marginal Blepharitis, by D. D. Conkey, West Superior.

Crime an Evidence of Disease, by F. G. Sherwood, Superior.

Laparotomy; Report of Twenty-six Cases, by J. V. R. Lyman, Eau Claire.

Scarlet Fever, by A. F. Heising, Menomonie.

Errors of Refraction and their Relation to Headache and Other Reflex Neuroses, by F. R. Reynolds, Menomonie.

Appendicitis with Abscess, by S. L. Pickett, Wilson.

Acute Enterocolitis, by H. E. McIntyre, Hudson.

Fatal Chorea, by J. B. Trowbridge, Hayward.

Practical Remarks on Neurasthenia, by I. D. Wiltrout, Hudson.

Laparotomy and the early removal of Ovarian Tumors, based on result of Forty Cases, also Subsequent Symptoms, and the Cases indicating Drainage, by A. E. Bonneville, Ashland.

Urethritis, by J. A. Rene, West Superior.

WHITE OF EGG IN THE TREATMENT OF SORE NIPPLES.—F. Van Allen, M.D., writes to the *New York Medical Journal* of three cases in which he found white of egg, painted on sore nipples several times a day, entirely healed them in a few hours.

The albumen may best be applied just after nursing, while the nipple is still moist from the baby's mouth. As somewhat of a thick film is formed, it is well for the nipple to be moistened with a soft cloth dipped in water just before the baby is again put to the breast. The efficiency of the albumen is heightened by allowing it to dry on thoroughly before drawing the clothes again over the breast.

AUSTIN DISTRICT MEDICAL SOCIETY.—The seventeenth quarterly meeting of the Austin District Medical Society and joint session with the Central Texas Medical Association, will be held at Austin, Texas, Thursday, December 17, 1891.

Programme.—Morning session, 10 o'clock.

1. Address of Welcome.

2. Reading of Minutes.

3. Applications for Membership.

4. "Enteritis Simulating Bowel Obstruction," by Dr. Daniel Parker, of Calvert; discussion opened by Dr. J. M. Frazier, of Waco, and Dr. W. A. Howard, of Waco, all of the C. T. M. A.

5. "Perityphilitis," Dr. W. R. Blailock, of McGregor, discussion opened by Dr. G. B. Foscoe, of Waco, and Dr. W. E. Brown, of Gatesville, all of the C. T. M. A.

Afternoon Session, 3 o'clock.

6. "Is Syphilis Transmitted Directly from the Father to the Child?" Affirmative: Dr. C. O. Weller, of Austin; Negative: Dr. W. T. Richmond, of Manor, both of A. D. M. S.

7. "The Management of Abortions," by Dr. J. W. Carhart, of Lampasas; discussion opened by Dr. T. D. Wooten, of Austin, and Dr. G. W. Christian, of Burnet, all of the A. D. M. S.

8. Voluntary Papers.

9. Verbal Reports of Cases.

10. Unfinished Business.

11. New Business.

12. Election of Officers.

13. Retiring President's Address.

14. Banquet at Night.

The Society will meet in Medical Hall, 513 Cong. Ave., and be called to order promptly at 10 A.M.

J. W. McLAUGHLIN, President.

T. J. BENNETT, Secretary.

TO SAVE THE BABIES.—There are over one hundred babies born out of wedlock every month in the Public and Private Hospitals of Chicago. Nearly all of these babies are offered for adoption by their mothers when they are two or three weeks old, but being unable to give them away they place them in the baby farms or boarding houses to die of a slow death, or they dispose of them by other questionable methods.

Their mothers are not hardened criminals or women of the town. They are deceived young woman from our factories and workshops who have been led astray. Many of them are from country towns and have been sent to Chicago for hospital service.

The babies are generally two or three weeks old when offered for adoption. Most of them are healthy, strong babies, entirely free from inherited disease, black eyed babies, brown-eyed babies, blue-eyed babies, blondes and brunettes, of every nationality, and they are finer specimens physically and mentally than the average run of children born in wedlock.

The Children's Aid Society of Chicago has undertaken the rescue of these babies from an untimely death, and they ask the coöperation and assistance of all practicing physicians. In case of the death of an infant anywhere in the country we ask that the attending physician will recommend to the bereaved mother that she adopt one of these babies and nurse it and raise it as her own. If the doctor will send immediately a description of the lost baby, we will duplicate it from the large number offered for adoption and send it by the next train to its new mother. The selection will be carefully made by a competent physician to secure a perfectly sound child.

The only expense to the receiver of the child will be the railroad fare of the nurse who brings the child.

Address the Children's Aid Society, P. F. Chase, Supt., Room 44, No. 204 Dearborn St., Chicago.

NEW YORK STATE MEDICAL SOCIETY.—The next meeting of the Medical Society of the State of New York will be held at Albany, February 2, 3 and 4, 1892. Dr. Seneca D. Powell, No. 12 West 40th street, New York; Dr. James D. Spencer, of Watertown, and Dr. Franklin Townsend, No. 2 Park place, Albany, have been appointed the business committee. Any communication regarding papers or any matter pertaining to the business of the Society which should properly come before the business committee, should be addressed to Dr. Seneca D. Powell, 12 West 40th street, New York City. A. Walter Suiter, president; F. C. Curtis, secretary.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending November 7, 1891.

Surgeon Manly H. Simons, ordered to U. S. S. "Mohican."
Medical Inspector Frank DuBois, ordered to U. S. S. "Philadelphia."
Medical Inspector T. Woolverton, detached from U. S. S. "Philadelphia," and ordered before Retiring Board.
Asst. Surgeon N. J. Blackwood, detached from U. S. S. "Newark," and ordered to Navy Yard, League Island, Pa.
Asst. Surgeon C. DeW. Brownell, detached from Navy Yard, League Island, and ordered to U. S. S. "Newark."
P. A. Surgeon Philip Leach, detached from the Naval Academy, and ordered to U. S. S. "Monocacy."
Asst. Surgeon John E. Page, detached from the U. S. R. S. "Independence," and to the U. S. S. "Iroquois."
Asst. Surgeon James G. Field, detached from Bureau of Medicine and Surgery, and placed on waiting orders.

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ORIGINAL ARTICLES.

LITIGATION DISEASE A FORM OF NEUROSIS.

*Read in the Section on Medical Jurisprudence and Neurology, at the
Forty-second Annual Meeting of the American Medical Association,
held at Washington, D. C., May, 1891.*

BY HERBERT JUDD, M.D.,
OF GALESBURG, ILL.

During the fall of 1881, E. S., aged 60 years, in form tall and slim, temperate habits, previous health always good, a noble specimen of average humanity, occupation farmer and dealer in stock, an expert in this line of business, was on his way to Chicago from W., Iowa. While at a feeding station he was standing in the rear door of the way car looking out, the train was backed to way car with such force as to loosen the upper bunk next the door at his right side; as the bunk fell into its place it struck S. on the right shoulder and arm, and also caught the right hand, crushing one of the fingers; the finger was at this time dressed with a rag at hand by the other stockmen. S. completed his trip to Chicago, nearly two hundred miles, made a satisfactory disposal of his cattle and returned home. The accident and injury being noised about, a lawyer called himself into the case, a doctor was employed, and after a short time suit was brought against the railroad company.

On the morning of March 14, 1882, I was called from breakfast at my home in Galesburg, to the door, to find E. S., who, in the way of introduction, handed me the card of a prominent railroad attorney in Chicago. Inviting S. to breakfast, the above history of his case was learned. The man's appearance was favorable. He seemed to be unable to use his right arm and hand, the arm being carefully carried in a sling, with the hand between a button space in his outer coat. He fed himself with his left hand. Having been injured some six months previous, he had acquired this habit, and had become an adept at feeding himself with his left hand. There was not a line of pain about this man, and his every appearance would indicate to a close observer a strictly honest, conscientious person. He appreciated every courtesy shown him, and after

reaching my office, myself and assistant, having ascertained that the finger had never been dressed or redressed since the time of the accident, some six months previous, we suggested to him that it was time to remove the filthy crust about the finger. He acquiesced in this. After getting the finger bare, it was found to have been thoroughly and properly healed for months; thereupon we suggested, as nicely as possible, the shoulder and arm had also recovered. To this suggestion a prompt denial was made, although accompanied with a candid declaration that aside from extreme care used when a change of clothing was necessitated, no attempt was made to use the shoulder or arm since it was first examined and put in a sling some six months previous. S. was afraid of being hurt; he said he was willing for us to examine him; that he wanted to do what was right and fair; that he knew he was injured, permanently injured, but other persons, whom he had no reason to suspect or distrust, had plainly told him there was nothing the matter with him; that he had been sent to me for examination, and was willing to submit to what was right, but he did not propose to be hurt. "I want to be fair and honest with everybody as far as I know," was what he said. We proposed to administer chloroform to him in order to make an examination and to do the necessary manipulation without causing him pain. He sternly refused, and as a reason stated that he had been instructed by his lawyer and by his doctor not to take chloroform for an examination. We spent one hour patiently in getting this man stripped. In the meantime a Drescher faradic battery had been placed on a table conveniently near, and after much persistent childish persuasion we did get him to clasp in each hand an electrode, with the primary current mildly established, then by suddenly turning the switch the secondary current was established, and the withered shoulder and arm responded naturally in a lively manner, and without pain. He was sitting before a large mirror, and as he witnessed himself in his curious gymnastics, he became first frightened, then angered. Matters being brought to a close, time was given him to realize his condition and think about his situation, which resulted in this state-

ment from him: That until then no one could have made him believe there was nothing the matter with himself. He could easily and naturally move his shoulder, arm and hand, and aside from the wasted condition of the muscles, and the palsied appearance, everything was right and had been for months and months. He cried with joy, then he scolded himself in disgust. He said he was willing to do anything to keep from further disgrace. The railroad company had months previously made this man a liberal offer in money for his injury, but suit had been brought in his behalf against the company for a large sum based upon permanent injury. He quietly took the money that had been offered him, and a speculation lawyer was out of a job.

We believed from the first that this man was honest. We afterwards ascertained that he bore a good name, but that he was ignorant outside of his own business, and that he was easily influenced. He was told by *interested* persons that he was injured, permanently injured, and his cupidity overpowered his judgment. No practical attempt had been made to convince him that he was recovered, and that he was not still suffering from his injury, before I saw him. The demonstration that there was no paralysis in the shoulder or arm was so simple and clear that he was overpowered with joyful emotion, simple and natural in its character. The experience and knowledge gained in this case have caused me to follow up and watch other cases of a similar character, cases in which suits have been brought and judgments of large amounts have been paid, and which were, after settlement, followed by a speedy convalescence and total recovery,—cases which previous to settlement had been bed-ridden for a term of years, and during the trial were pronounced by high medical and legal authority in court as being permanently injured, hopelessly so—two cases in which death was predicated within the space of three or four years in the presence of the court, and within the hearing of the *condemned* plaintiff.

I have cited the case of E. S., for the reason that it is typical of this class of cases. It is clean cut and can be identified. The injury was slight and simple, but nevertheless was made the basis of an important suit at law to recover heavy damages for an alleged permanent injury. It is the small and simple things, neglected in this world, that cause most of our trouble. I believe that such persons can be said to be suffering from "*litigation disease*;" that this condition can be truthfully stated as a form of neurosis in which fright, or shock, temporary disturbance from business, and many other trivial things, naturally figures, which under other circumstances would be unaccountable, and that in all of these cases the proper course to pursue must be kind attention properly administered, and in

all cases where the question of liability for damages is conceded, a prompt and liberal payment of money on the part of the corporation or railroad company should be made—a functional nervous disease will then be rapidly and permanently cured; that it is safe and humane to look upon these cases as a form of functional nervous disease, meaning of course the class of cases as illustrated by E. S. I never had the heart to style S. as a malingerer. I do not believe he knew any better. He was told by *interested* persons that he was injured, permanently injured, and that the railroad company was liable, and could be made to pay a large sum of money—all of which he believed; and the part he most believed and knew to be true was that he was injured, permanently injured; and here is where I think I am warranted in bringing this paper before you. It is to call your attention to the peculiar condition of a person who has been in an accident and who was at that time injured, and wherein is conceded the payment of money to him for the damage done him. We all know that a functional nervous disease can be made organic, lasting, permanent, and it is certainly hard, impossible sometimes to demonstrate that such a person has not received a permanent injury; that he is not suffering from an organic disease caused by his injury, incurable in its character, and possibly progressive as regards bad results or death. Particularly is this the case in *neglected* cases that are solicited by *interested* persons, and placed in litigation; cases in which it is certainly easier and more natural to exaggerate than it is to simplify or improve. I never knew but one man to get better, to improve on a line of recovery while his case was being litigated, and I expect to have to look a long time before I find another. It is out of the line of ordinary humanity. It is a fact that such cases are knowingly or unknowingly terribly abused; that justice relative to them is travestied. These cases are put in court, and verdicts for enormous sums are obtained and paid. Permanent injury is alleged and proven to the satisfaction of the court and jury; death is even predicated openly in court, and with no respect paid to ordinary rules of medical practice, and after all this has been so skillfully done such cases have been known to recover, rapidly recover. It is a fact that this is the rule, and not the exception in this class of cases.

Railroad companies, corporations and cities in this country are paying millions of dollars to such persons. The Government is doing the same. The advantage and the gain is with all such. They have nothing to lose. If the machinery to run such a case in one city is not complete, the patient is packed off to another city. Some noted specialist in nervous diseases is reached through his cupidity. No dishonesty

can be attached to him. The electric battery is called into use. *The reaction of degeneration* is found. Organic disease is supposed, and *claimed to be proven*; actual cautery even, is applied along and over the spine, and this, too, in a case that bears every aspect that the patient may succumb under this terrible treatment, and the wonder is that he did not. I am no expert lawyer. I am no expert doctor, not even a medical professor, but fortunately or unfortunately it has been my lot to witness just such cases and to see just such procedures as herein detailed, and I am here to cry HALT. I never have seen nor do I expect to see a case of pronounced legitimate injury in court and under trial for money to be paid, wherein the question of liability has been concerned. This is a hard statement, but the facts are prolific, extremely abundant, existing all through this country, that bear me out in the statement. I find my sympathy with this non-malingering class of cases. They are certainly *injured* persons in more ways than one. They are practically suffering from functional nervous disease; I have styled it "litigation disease," a form of neurosis, same as we call certain nervous conditions hysteria, and other functional nervous conditions neurasthenia. These persons are so conditioned as to be beyond self-control. They have, in a *hasty* and *unpremeditated* manner, *signed* away their liberty, and this in a free country. They are being fitted for a legal race, in which they are bound to win, regardless of all professional honor and integrity. Whether as yet this practice can strictly be called fraudulent, remains in some cases to be seen, to be found out. The results certainly bear out the conviction that somebody was terribly mistaken.

In discussion, Dr. Clevenger said:

Mr. Chairman and Gentlemen: The scientific aspects of Erichson's disease are obscured, and all that concerns the matter of spinal concussion is wrangled over for the very simple reason that there is money involved. I may say it concerns contention over millions of dollars. Were typhoid fever, or any similar complaint, dragged into court and made the basis of a money issue, there would instantly arise a host of interested parties claiming that there was no such disease. Where the carrion is, the buzzards will gather, and lawyers seek out witnesses who best serve their particular side. They do not want the judicial-minded physician (unless they have a very strong case), and both for plaintiff and defendant we too often see (*not always, but too often*) the buzzard doctor swearing sturdily to anything, almost, that his attorney requires. By a process of elimination, the unpurchaseable physician (and there is plenty of him) is less often seen in court, and the buzzardy swarms are contemptu-

ously regarded by juries, judges and lawyers as constituting "experts."

But the expert standard is gradually being raised, and it suffices no longer that the witness may ventilate himself of an opinion; he must now give reasons for his belief.

The bombastic surgical bluffer who pooh poohs at the lost leg, and congratulates the victim upon his freedom from corns and bunions, has had his day, as well as the calamity doctor, who rears mountains out of molehills.

There is a golden mean in this matter that can be arrived at by a little study. Dr. Rohr recently called me to the case of Fred Schultz, who two years previously had fallen from a stool backward upon a pile of bricks, and suffered all the characteristics of Erichson's disease, finally dying therefrom, notwithstanding that there was no damage claim, and his ignorant neighbors had declared that he was only lazy, and wanted to escape work by pretending to be sick. On the other hand, at Frankfort, Indiana, the case of George E. Miller against the Monon road ended in establishing the fact that he had filed a pension claim just one month before the wreck, and his pension application contained the sworn statement of a spinal injury sustained in 1864, disabling him from earning a living, while his declaration against the railroad alleged the same thing as resulting from the railway accident, and that previous thereto he had been strong and healthy. As both these statements were judicial affidavits, there would be considerable difficulty in determining which should be believed.

Dr. Watson's experiments, as stated by himself in his recent publication, do not justify the deductions he makes from them; in fact, there is little connection between his facts and inferences, and, further, the experiments themselves bear very little upon the subject.

In last year's Surgical Section, Dr. Watson took occasion to speak of the alienist as cultivating a "pseudo science." So ill-advised an assertion convicts him of not possessing the "mental breadth" he has just mentioned as necessary in the investigation of spinal concussion.

Dr. Spitzka recently called my attention to an article by Hans Ichmans in *Virchow's Archiv*, p. 326, vol. 122, strongly sustaining my claim of tangible results in Erichson's disease, and time does not permit me to more than allude to Oppenheim's statement (*Neurolog. Centralblatt*, Aug. 15, 1889): "In the majority of cases the symptoms unite to form a type of disease which cannot, in the present state of our knowledge, be mistaken, from its significance, its clearness, its objective character, and the sharpness with which it is defined. In the polyclinic where I examine such cases before a large audience of students and physicians, in almost three-quarters of the cases I develop the diagnosis in a convincing

manner on the first examination, so that I often hear the question, 'How is it possible that such diseases should be regarded as simulated?' "

Dr. King said that he would like to know what constituted spinal concussion.

Dr. Hughes requested Dr. King to tell us what was the lesion in cerebral concussion, and we might be able to answer his question as to spinal concussion.

Dr. Lydston asked Dr. King if he believed in surgical shock.

Dr. King said that he did.

Dr. Lydston then asked for its pathology.

Dr. King: Hæmorrhage.

Dr. Clevenger: What organs are affected?

Dr. King: The whole man.

Dr. Clevenger: So is the entire man affected in spinal concussion.

Dr. G. Frank Lydston said:

Too much stress has been laid upon the nomenclature of spinal, and especially railroad spinal injuries. As the term spinal concussion is generally applied it is not remarkable that there should exist so many conflicting opinions. Concussion of the spine as an entity does not exist, neither in my opinion does concussion of the brain. But that certain varying symptoms dependent on widely different pathological conditions may result from a jarring of the cerebro-spinal axis, must, I think, be admitted.

I have this to say of the theory of molecular vibration as a cause of the symptoms following spinal injuries. The most rational theory of nervous conduction yet advanced is that of molecular motion now if we may except this view we must believe that disturbances of the normal molecular arrangement of the nervous structures will almost necessarily produce aberration of nervous function and, if these disturbances be severe, it is rational to expect permanent morbid effects in a certain number of cases.

The argument has been advanced here to-day, that "spinal concussion" has not occurred unless there be anatomical changes in the cord. This is begging the question. Must we hit our patients in the head with an ax so that we may examine the cord for anatomical lesions? Is it necessary to see the ileum in typhoid in order to believe in the existence of such a fever? Is tetanus none the less real because of its obscure and scant morbid anatomy? Must we throw every functional disease out of court because there is no morbid anatomy? No, and yet that is what the railway surgeon proposes to do with spinal concussion. Accept the view that concussion is a physical influence upon the spinal cord, which may produce a varying degree of morbid phenomena according to the severity of the jarring, and the subject will be divested of much of its confusion. It is to be remembered that the tissue protoplasm of the cerebro-spinal axis may be acted upon by

jars in very much the same manner as the amoeba by an electrical discharge. It is probable that the cause of death by lightning or electric current is a severe concussion of the nerve tissue, inhibiting the energy of the protoplasm of the nerve cells.

Dr. Manley speaks of the manner in which the spinal fluid acts as a water bed in the protection of the spine. I fancy this water bed does not stand the criminal who is hung in good stead, it certainly does not completely defend the spine from jars. Indeed I fancy there is more of compensation than design in its presence in the spinal canal—its presence is due to the necessity for filling the vacuum incidental to the loose and mobile texture of the envelopments of the cord. It is possible that it favors rather than otherwise the transmission of jars to the cord.

There is one question that I should like to ask of those who do not believe in the theory of spinal concussion. Can you tell me the precise condition in surgical shock? Can you determine in fatal cases that the patient died of shock, by the morbid anatomy present? I fancy you cannot, yet fatal cases do occur, and short of a fatal result we meet with not a few cases of chronic invalidism. The assertion that a person who has suffered from a railroad injury is "never the same man again" is not without foundation. We cannot throw all the neuroses in which there are no anatomical lesions, out of court, and yet, that is what we are asked to do in the case of railway spine, or Erichson's disease.

Laying all theory aside, the practitioner is confronted with many cases in which the settlement of damages does not cure the case, and many in which they even get worse after settlement. There are many frauds perpetrated against railroads it is true, but in the aggregate I think the roads get the best of the bargain.

Both sides must be fair and charitable. A few isolated instances of surgeons who sell their souls to railroad corporations do not prove all railroad surgeons to be knaves; a few mistakes should not stamp all of them as ignoramuses. On the other hand, an occasional fraud does not disprove the honesty of a large class of railway litigants. Let us lay personalities and recriminations aside and seek for the truth in these cases.

In my own experience I have seen a case of lateral curvature which I believe to have been due to a concussion of the spine from a fall upon the buttocks. This developed within a few weeks after the injury and was attended by spinal tenderness, neuralgia, etc. In another case paralysis of the serratus magnus seemed unquestionably to be due to spinal concussion. Dr. Moyer is now treating one of my cases in which most profound nervous symptoms have developed—without paralysis—chiefly since her case was satisfactorily settled by the railroad.

PARETIC DEMENTIA AND LIFE INSURANCE.

Read in the Section of Medical Jurisprudence and Neurology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY JAS. G. KIERNAN, M.D.,
OF CHICAGO.

FELLOW OF THE CHICAGO ACADEMY OF MEDICINE.

The increase of paretic dementia among civilized nations has created many important legal problems for solution. The present question has puzzled the solicitors of more than one insurance company. In a case which came under my own observation, a paretic dement insured his life. A month later he was adjudged insane and sent to the Cook County insane hospital, of which I was then Superintendent. Eight months later he died in an apoplectiform attack.

Dr. S. V. Clevenger has had under care a commercial traveler addicted to sexual excess and paretic, who, precedent to May 6, 1889, had spinal symptoms of paretic dementia, following which came a condition of emotional exaltation. His life was insured precedent to the spinal symptoms for \$5,000. In a period of emotional exaltation he desired to increase this to \$20,000, which was done in January, 1890. June 4, 1890, he died in an apoplectiform attack. The solicitors of the company wrote to Dr. Clevenger to know if the patient *knew* he was suffering from insanity when he consulted the doctor. After such a bright attempt to manufacture evidence of fraud, it is not surprising that the company had to pay the full amount.

Legrand du Saulle¹ reports the following case: Dr. Blank, a physician well known in science, had had for more than nine years an insurance of \$20,000 on his life. He suddenly gave unequivocal evidence of mental impairment, went mad and came rapidly, wrote and spoke a great deal. He had an exaggerated opinion of his labors, vaunted his success in practice, and boasted of his professional ability. In one of his walks he accidentally met the President of the company in which his life was insured. After a long conversation, Dr. Blank said that his life was insured for an insignificant sum, and that he had resolved to increase the amount to \$100,000. He was referred to the proper authorities, who consented. The policy was prepared, and all that was needed to complete the assurance was a receipt for the same. The agent, who was ready to deliver the policy on the signature of the receipt, suddenly noted, just as the doctor was about to sign this, that the latter talked rather freely and loudly. Suspecting intoxication, he put off delivery of the policy until Dr. Blank should become sober, claiming to have forgotten some important formality. The following day the physician was sent to an insane hospital for the insane, where he died in six

months from paretic dementia. The company paid the \$20,000 to his widow, and esteemed itself happy that it did not have to pay the \$100,000 for which the husband had desired, in a fit of pathological temerity, to assure his life.

The intellectual powers of a paretic dement are such as make him an easy prey to the blandishments of any "sharp" insurance agent who would believe him, from his apparently excellent health, to be a good risk. Once started in the life insurance direction, the paretic dement might keep on, like Legrand du Saulle's patient, increasing the insurance on the life of the valuable citizen he believes himself to be, since paretics have a tendency to adopt and extend ideas derived from others, as shown by the case of the paretic dement cited by Spitzka, who, saved by his wife from a paretic suicide, proposed to erect a monument to her for saving the life of so valuable a citizen. It is curious how often this psychosis escapes observation by the non-alienist physician and laymen, when compared with the ease with which it is diagnosed by even asylum attendants familiar with it. In two cases which occurred in New York State, two cashiers of banks who had been paretic demented for at least two years, nearly brought the bank to a condition of insolvency by simple lack of attention to business, but their mental condition had not been at all suspected by their business associates. A Chicago saloon keeper with a paretic delusion of having inherited \$2,000,000, was interviewed by the reporters of every paper in the city, by none of whom was his mental condition suspected until his friends took measures to have him placed under treatment in the county hospital for the insane. There is, therefore, nothing antagonistic to the existence of paretic dementia in the fact that a man insures his life for a large amount, and his mental condition escapes observation from the business men of the company. It may, however, be urged that the medical officers of the companies would detect the psychosis. He who knows how these medical officers are chosen, either from relatives or connections of the officials of the companies; or by agents who tell the physician that "he must not be too strict," or for political reasons to influence State Legislatures, from medical politicians (who indulge in "graveyard" insurance dodges in which they get caught sometimes, but not as a rule), will scoff at the idea that men like these, who neither know nor care to learn anything of psychiatry, could be of value in the detection of insanity.

The same point is still more strongly illustrated by another case cited by Legrand du Saulle: Two brothers presented themselves at the office of a French alienist. The elder brother entered the office first, and asked the alienist to examine with care the patient brought him. "There

¹ Gaz. des Hôpitaux, 1884.

seems to be nothing the matter with my brother," said he, "but he is no longer the same." The physician, after a long examination, said: "Your brother is in the initial stages of paretic dementia." Explanations were then given, and the prophecy made that the patient would die in three or four years. The following day an insurance of \$20,000 was placed on the life of the patient. Three years after, the brother pocketed the amount. In Germany, a medical officer of a railway corporation claimed that symptoms of paretic dementia presented by a 43-year old man were only changes due to old age.

Hanot² calls attention to the dangers to which life insurance companies are exposed from this class of patients, who, as already stated, escape the diagnostic ability of the average insurance company's physician, who is worthless in the detection of this psychosis.

Is the insurance effected on the life of a paretic dement, by himself or his relatives, in good faith, binding on the company making such assurance? The Supreme Court of Iowa has decided that persons of unsound mind are to be held bound by an executed contract or conveyance where the transaction is fair and reasonable, and in the ordinary course of business, and where the mental condition of the party is unknown to the second part, and the parties cannot be placed *in status quo ante*. The converse of this necessarily follows. A paretic dement cannot be guilty of fraud, for fraud implies a knowledge of the true state of things, and of such knowledge the paretic dement is destitute. A paretic dement effects an assurance on his life because of his psychosis. If contracts with the insane, under the circumstances mentioned by the Iowa decision, are binding, then his policies are binding on the company. If the policies were binding on the companies, no suicide by him could vitiate them. It may be admitted that, even assuming the truth of all the circumstances, it was an injustice to burden the companies with the results of the actions of an insane man. With the consequences of a law a judge has nothing to do; his duty is to declare what that law is, and the same holds good of a scientist and scientific truth. The companies were themselves to blame for accepting such a risk—a risk offered by the would-be policy holder in good faith. It may seem hard on the companies, but it would also be hard on the family of paretic dement if they should be deprived of the provision made for them. The life insurance companies use all means to detect fraud and to ascertain the value of risks. If such means prove insufficient, not through fraud of the policy holder, but through the incapacity of the company's agents, the company should be held responsible.

Another aspect of the case presents itself. If

a paretic dement insured his life, and then, with a paretic idea of smartness, committed suicide to compel the company to suffer for some imagined affront, or with the vague idea of making money for his friends, would this act vitiate his policy? Under the Iowa decision, I believe not. Legally, I believe the policy could not be declared void, however seemingly unjust its non-voidance, or rather the full requirement of all its provisions, under the circumstances, would be. The question simply resolves itself into this: Can a contract which *per se* involves an element of risk, all means of diminishing which risk are supposed to be taken by one of the persons making the contract, be regarded as void because, without fraud on the part of the other party to the contract, the risk proves greater than was anticipated? Life insurance contracts are based on the theory that the company ascertain the exact condition as regards disease. If the insured have an ordinary physical disease unknown to himself and the examiner, and die from such disease, the company is held bound to pay the amount of the policy. It would seem that the same rule should hold good in the case of a paretic dement. Though stockholders suffer unjustly in case of paretic dement from the inventive stupidity of agents and medical officers, yet their own negligence has been the cause of this loss. In the case of the two brothers cited by Legrande du Saulle, fraudulent intent was clearly evident, and probably that policy could have been set aside.

MEDICO-LEGAL INVESTIGATION OF DEATHS BY VIOLENCE IN MASSACHUSETTS.

Read before the Section on Medical Jurisprudence and Neurology at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY SILAS D. PRESBERRY, M.D.,
OF TAUNTON, MASS.

In 1877 the Legislature of Massachusetts passed "An Act to abolish the office of coroner and to provide for medical examinations and inquests in cases of death by violence." By the terms of this act the county commissioners in each county, except that of Suffolk, were called upon to "divide their several counties into suitable districts for the appointment of one medical examiner in each district;" and such examiner, while appointed from a district, has the power to exercise his function in any part of the county of which his district is a portion. In practice, however, an examiner does not act in the district of another except in case of absence or disability of the latter. Examiners hold office for seven years and are appointed by the governor and by and with the advice of the council.

The thirteen counties were divided into 68

² Annales d'Hygiene, 1884.

districts, according to the distribution of centres of population in each county. The usual number of districts is four, but some counties have more and some less than that number. Each examiner is sworn and gives bonds with sureties in the sum of \$5,000 to the treasurer of the county conditioned for the faithful performance of the duties of his office. Every medical examiner is required annually, on or before the first day of March, to transmit to the secretary of the commonwealth certified copies of the records of all deaths which have occurred during the previous year, the cause and manner of which he has officially investigated. For this purpose blank books for records and blank forms for returns are supplied to each examiner. A small fee is allowed and paid by the commonwealth for these returns as is done for the returns of births. These returns are bound and indexed, and preserved for reference, and from them are prepared and published by the secretary of the commonwealth such tabular results as will render them of practical utility.

The work of the examiner may be best studied under the following heads: 1. Notification; 2. View; 3. Autopsy; 4. Records; 5. Fees.

1. Notification. Examinations under this law are made "upon the view of the dead bodies of such persons only as are supposed to have come to their death by violence," and "whenever a medical examiner has notice that there has been found or is lying in his county, the dead body of a person who is supposed to have come to his death by violence, he shall forthwith repair to the place where such body lies and take charge of the same."

There is nothing in the law to indicate what shall constitute official notice, nor to show who has authority to give such notice. According to the theory and practice, any responsible person has such authority, and the intent of the law, it is to be presumed, was to allow the broadest liberty in the notification. As a matter of fact the calls usually come through the police in cities, the selectmen or their representatives in towns, the officers of corporations, the undertakers, some member of the family of the deceased, the person finding a body, or possibly, though not frequently, notice may be given by some neighbor or enemy even of the deceased, who is inclined to be suspicious or desirous of settling some old score by instituting investigation. The most motive is rarely successful, since almost without exception the services of the examiner are welcomed by the unfortunate family.

The question, shall an examiner ever refuse to make a view, has been discussed by the examiner, and the general opinion is that he should not refuse, unless there has been a misapprehension of the condition under which he is required to exercise his functions. It is not sufficient to

say that one died without medical attendance, but the idea of suspected violence must enter into the case. The boards of health of cities and towns are authorized to give certificates of the cause of death in cases of uncertified deaths, not suspected of violence. Not infrequently the examiner is consulted by undertakers, sometimes by town officers, to learn whether a certain dead body should be the subject of official view, and the answer turns entirely upon the question of the possibility of any one supposing that the death may have been caused by violence. If there be such a reasonable possibility, it is undoubtedly a case for view.

2. View. Having been notified, the examiner is required by law forthwith to repair to the place where the body lies and to take charge of the same. He now makes a careful view of the body, with such accuracy as to enable him to say whether or not the body shows any marks of violence, and especially any marks sufficient to indicate the cause of death. For this purpose the usual custom is to have the body entirely naked and to make careful inspection of every part. He also makes personal inquiry into the cause and manner of the death, if any one can be found who can give information. Under some circumstances a careful investigation of the surroundings of the body becomes important evidence in the investigation. All the facts learned in this search are to be accurately recorded.

If upon this view and inquiry the examiner is convinced that the death was not caused by violence, he will deliver the custody of the body to the friends of the deceased, if there be such. In case the body is not claimed, or is unidentified, it is to be kept in his custody for forty-eight hours and then delivered to the overseers of the poor of the city or town wherein it is found lying. In case the body is not identified, a careful description of the deceased is to be made. The examiner next is to certify to the clerk or registrar of deaths the name or description of the deceased, together with cause and manner by and in which he came to his death. And here the investigation may end.

If, on the other hand, the examiner is convinced that the death was caused by violence, and he is able to determine without further examination, the cause and manner of death, he will certify as before to the registrar, and also notify the district attorney and a justice of the district, police or municipal court for the district or city in which the body lies, that there has been within the district a death by violence in the meaning of the law.

3. Autopsy. If the examiner is unable to determine satisfactorily the cause of death without autopsy, and he deems a further examination necessary, he shall so report to the district attorney or to the mayor or to the selectmen of the

district, city or town where such body lies. Any of these officers may authorize him in writing to make an autopsy, but he can make no autopsy officially without such authority. Before proceeding to make an autopsy he shall employ two or more discreet persons, one or more of whom may be physicians, and he shall first call their attention to the position and appearance of the body, and in their presence he shall make an autopsy of sufficient thoroughness to fully establish the cause of death, or to establish the fact that the cause can not be learned by autopsy. The examiner, if he deems it necessary, may employ a chemist to aid in the examination of the body, or of substances supposed to have caused or contributed to the death. The examiner, or a clerk whom he may employ, shall reduce to writing at the time of the autopsy any fact or circumstance tending to show the condition of the body and the cause and manner of death, together with the names and addresses of the witnesses, which record the examiner shall subscribe, and which is known as the record of the autopsy. A duly attested copy of the record is filed with the district attorney, and another with the justice of the district court, together with a certificate of a death by violence above described.

If, however, an examiner is of the opinion that a death was not caused by violence, and the district attorney or attorney general is of a contrary opinion, either the district attorney or the attorney general may, notwithstanding such an opinion, direct an inquest to be held in accordance with the provisions of the law, at which inquest he or some person designated by him shall be present and examine all the witnesses.

Since the action and opinion of the medical examiner turns wholly upon the question of violence, it becomes very desirable that the term violence be exactly defined, and yet, as in the case of notification, the law not only does not define it, but seems to use it in its broadest sense, if not indeed in differing senses. But since it is the object of the investigation to learn if any other person than the deceased has been either directly or indirectly causative of the death, it is fair to consider that the violence, which is to be officially reported, is a violence that may have been contributed to by the act or by the neglect of another. All cases of death by accident upon a railroad are, by special provision, to be reported for inquest, and the district attorney or attorney general may, if he deem it necessary or expedient, direct an inquest to be held in the case of any other casualty from which the death of a person results.

5. Fees. In the county of Suffolk, the examiners are paid annual salaries for all services performed. In all other parts of the State the examiners are paid fees as follows: For a view

without autopsy, five dollars; for a view and autopsy, thirty dollars; and for travel, at the rate of ten cents a mile to and from the place of view. The bills for the services are rendered quarterly to the county commissioners, who certify their correctness, when the fees are paid by the county treasurer. In case of autopsy, however, there must accompany the bill the certificate of the mayor or selectmen who authorized the autopsy, and a statement from the district attorney certifying that the autopsy was in his opinion necessary. In order to enable the district attorney to make this certificate, the examiner is required in every such case to file with the attorney together with his report of the autopsy an account of his view and personal inquiry in the case, and shall certify that in his opinion, the cause and manner of death could not be ascertained by view and inquiry, and that an autopsy was necessary for that purpose.

At this point the official relation of the examiner as such ceases, though he may or may not be employed as a witness at the inquest, or at the subsequent trial, if one follows.

Inquest. In case the examiner has notified, as above described, the justice of the district court that there has been a death by violence, the justice is required to hold an inquest, and is allowed no discretion in the matter except as to time and place of such inquest. At this hearing such witnesses as have been found to have any knowledge of the facts are summoned to testify, and the district attorney or some person designated by him may attend the inquest and examine all witnesses. In practice, the judge himself usually examines the witnesses.

After hearing the testimony the justice is required to draw up and sign a report in which he shall certify when, where, and by what means the person deceased came to his death; and if it appears that his death resulted wholly or in part from the unlawful act of any other person or persons, he shall further state the name or names of such person or persons, if known to him, and he shall file such report with the records of the superior court in the county wherein the inquest is held. The law further allows the justice to bind over such witnesses as he may think best, and requires him to take the necessary steps for the apprehension of any person or persons charged in his report with the commission of an offense.

Thus I have endeavored to describe to you the method of a medico-legal investigation of deaths by violence that has been practiced in Massachusetts since the abolition of the office of coroner, and naturally the question may arise, what has been gained by this change? In answer I will call your attention to a few of the points of gain. First, the expense, which to many minds is of first importance in matters of public concern, has been

diminished about one-third. Second, promptness in action and exactness in investigation have been accomplished. Third, all the facts of the case from the first discovery of the body to the finding of the justice are matters of accurate record and are material as evidence in the higher courts in case a trial follows the inquest. Fourth, the duties are now so divided that the man of medical training investigates so much of the case and only so much as has to do with the medical question of the cause and manner of the death, while the man of legal training settles the question of responsibility and determines whether or not a crime has been committed, what the nature of that crime, and, if possible, who is the suspected criminal. Fifth, the records in the hands of the secretary of the commonwealth constitute a valuable body of observed facts that may become of great value to the student of legal medicine. Last, the association of Medical Examiners, constituting the Massachusetts Medico Legal Society, has stimulated each examiner to keep himself well-informed and as far as possible prepared for any case that may fall to his lot. And in general, the diffusion through the State of a number of physicians specially interested in medico-legal research has tended to call the attention of physicians to that branch of medical study, and has had an influence to improve the grade of medical testimony in the courts of the commonwealth.

ETHER INEBRIETY.

Read in the Section of Medical Jurisprudence and Neurology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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Ireland has in the nineteenth century presented to the world two interesting and remarkable series of inebrio-psychological phenomena. In 1838, a simple-minded Roman Catholic priest, Father Mathew, adopted and began to advocate the practice of abstinence from all intoxicating drinks. So amazing was the impression made by him that, in three years, the roll of the teetotal pledges which he had administered exceeded 5,000,000, in Ireland, in addition to large numbers in England, Scotland and America. The reality of this epidemic of temperance was attested by the statement of the Chief Secretary, in 1840, that "the duties of the military and police in Ireland are now almost entirely confined to keeping the ground clear for the operation of Father Mathew." Though this great wave of sobriety has gradually receded, till now the extent of drinking in Erin is simply terrible. I am every now and again meeting professionally

with sons and daughters of Hibernia, who glory in their steadfastness to the pledge which they so long ago took at the hands of the Irish apostle of temperance. An accurate study of this unique crusade would, in psychological results, amply repay the labors of any earnest student of mental science.

Curious to relate, the other series of inebrio-psychological phenomena is an experience in an opposite direction—an experiment, so to speak, not, as in the former case, in temperance, but in intemperance.

ETHER INEBRIETY.

The disease of inebriety or narcomania (a mania for intoxication by any kind of narcotic or anæsthetic), may, besides other phases, assume a form correspondent to the particular inebriating substance. It may, therefore, be interesting to glance at the origin and growth of this new mode of inebriate indulgence, as this is the first opportunity afforded to us of observing the rise and progress of such a process in a community.

RISE AND PROGRESS IN IRELAND.

The centre from which ether drinking spread was the town of Draperstown (with a population of some 300), in the southern part of the County of Londonderry. Before Father Mathew's abstinence propaganda, ether drinking was there unknown. Between 1842 and 1845 a local medical practitioner, in response to a request from a few newly-pledged abstaining converts for something the taking of which would not violate their vow, gave them a drachm of ether in water. So far as I can ascertain, this was the *fons et origo mali*. A desire for more frequent doses grew upon the ether drinkers, and the practice spread in and around Draperstown till there was a shop for the sale of ether, in one town, to every twenty-three of the population. In the session of 1855-6, an Act was passed by the British Legislature allowing spirits of wine to be used duty-free in arts and manufactures, provided it was made nasty as a drink (which the Government, in their innocence, supposed would prevent people from drinking it) by the addition of a minimum $\frac{1}{9}$ of methylated spirit. As ether prepared in this way is much cheaper than ordinary sulphuric ether, this cheap production of "methylated ether" caused the consumption to increase "by leaps and bounds." The present ether area was, from its mountainous features, a central locality for the illicit distillation of whisky. Owing to the activity of the police and the making of roads, this illicit traffic was effectually stamped out. The disappointed cheap whisky drinkers found a cheap unintoxicant in ether. Mr. H. N. Draper first called attention to Irish ether drinking in 1877 (*Medical Press and Circular*, May 30), followed

by Dr. B. W. Richardson about 1879, and by Mr. Ernest Hart in 1890.

AREA OF DISTRIBUTION.

Ether drinking was in a year or so gradually introduced from Draperstown into the neighboring town of Maghera, and soon extended its sway till it occupied an area of somewhere about 295 square miles, with a population of nearly 79,000 souls. This area may, in general terms, be said to comprise the mountainous districts, especially of Derry and Tyrone, and to some extent, of Armagh and Antrim. Cases of ether intoxication have occurred in Dublin and other parts of Ireland, in Glasgow (Scotland), in Lincolnshire in England, and I have seen several in London.

THE ETHER DRINKERS.

All the cases which I have seen in England have been persons of education and refinement, who had first been alcoholic inebriates and gradually developed into devotees of these twin poisons. Nearly all of these English cases have been females, the only males having been members of the medical profession. In Ireland, women assert the equality of the sexes by taking their fair share of this form of intemperance. Small farmers and agricultural laborers make up the bulk of the Irish ether tipplers. Workmen, too, are well to the front. But the practice is by no means confined to these classes. Members of the learned professions have their representatives. Etherists are to be found at almost all ages from puberty onwards. Sturdy Irish lads and beautiful Irish lasses, brimful of Hibernian wit, as well as "60-year olds" of both sexes, are slaves to ether drunkenness. The mother may be seen with her daughters, and maybe a neighboring Irishwoman or two, at a friendly ether "bee." The habit has become so general that small shopkeepers treat the children who have been sent to purchase some article, with a small dose of ether, and schoolmasters have detected ether on the breaths of children from 10 to 14 (or even younger), on their arrival at school. Some critics have endeavored to lay the blame of this new development of inebriety on the Roman Catholic religion. Nothing could be more unwarrantable and unfair. The disease has spread principally among Roman Catholics, simply because this is the creed of the greater part of the population. One Protestant village, Tobermore, is as bad as any other place. All my cases have been Protestants.

QUANTITY TAKEN.

The amount swallowed at a draught varies mainly with the stage of education in ether consumption. A novice will find a drachm (a teaspoonful) sufficient. Gradually the wished for effect demands an increased dose, till $\frac{1}{4}$ of an oz. may in time become the ordinary "peg" of

an accomplished drinker, to use the phraseology of Anglo-Indians. These are average quantities of a so called "moderate" drinker. More "seasoned casks" have a higher capacity, many topping off half a wineglassful as unconcernedly as an average Englishman would drink a glass of claret, or an average American a glass of champagne.

The amount of ether consumed in a day is often remarkable. A confirmed ether inebriate will take a much larger dose than any I have just enumerated, and repeat the dose three, four, five, or even six times in the twenty-four hours, when "on the spree." Indeed, in some cases, half a pint has been the regular daily allowance of constant (or habitual) inebriates. In England I have known an ether inebriate use a pint of ether by inhalation every day. In Ireland, many persons keep themselves intoxicated pretty well during the day for the sum of sixpence—taking two pennyworth at 10 o'clock, 1 o'clock and 4 o'clock. What a paradise for drunkards! Drunk three times a day for 13 cents!

HOW TAKEN.

In England, in my own practice, the majority of ether drinkers have inhaled the poison. In Ireland the universal method is drinking. By the latter mode the ether is taken "neat." Owing to an idea that ether, like whisky or brandy should be drunk diluted with water to sheathe the virulence of the poison, the uninitiated and ignorant Englishman, when in Ireland, sometimes mixes his ether "peg" with water, "just to try the stuff, you know." Ludicrous failure awaits him, for, unlike ardent spirits, ether is but sparingly soluble in water. The pungency of ether, except to those who have "finished their education," generally calls for an "over-ture" to the "act" of ether swallowing. Scene I.—The mouth is washed out with cold water. Scene II.—A draught of cold water is drunk. Scene III.—The ether is swallowed "neat." Scene IV.—The performance closes with a second and final drink of cold water. The preliminary draughts of water are to cool the mouth and throat, and the post-ether draught is "to keep the ether from rising." The washing of the mouth is soon omitted. By-and-by the preliminary draught of water follows the same fate, the ether dose and the succeeding draught of water being the commonest method. As his educational advances, the etherist dispenses with water altogether. He may for a while, especially when drinking an unusually large dose, hold his nose with one hand, but probably ends by despising all precautionary safeguards, and by simply drinking his mouthful of ether at a gulp.

WHAT IS TAKEN.

Ether purus of the British Pharmacopœia w

at one time affected by my inebriate patients. This pure ether ($C_2H_5)_2O$, which is free from alcohol and water, has been in my hands the only ether preparation which has proved to be without complicatory drawbacks when used as an anæsthetic (Brit. Pharmacopœia, 720; U. S., 725). *Ether* of the B. P. (sulphuric ether) was, however, the article generally used for purposes of intoxication. It contains 8 per cent. of alcohol and water with 92 per cent. of *ether purus*, and is soluble in all proportions with rectified spirit, but in only 1 in 10 with water. The specific gravity should be (B. P.) .735; (U. S.) .750. It is a swift, potent, diffusible stimulant, narcotic, anæsthetic and antispasmodic, of great value in medicine. It has a strong, penetrating odor, is sweetish, hot, burning and pungent to the palate.

To America the whole world owes a deep debt of gratitude for the introduction of ether as an anæsthetic by Dr. Morton, in Boston, in 1846, and any saddening misuse of this grand mode of alleviating human suffering ought not to lessen our appreciation of this splendid boon to humanity.

By the Act 18 and 19 Vict., c. 37 (1855-6) the use of spirit of wine, free of duty, was permitted in the arts and manufactures, on the addition of a minimum of $\frac{1}{9}$ of wood-naphtha (methylic alcohol or spirit from the destructive distillation of wood, after rectification; specific gravity .803 B. P.), with a view to prevent this fouled liquid from being drunk as a beverage. Ether prepared from this fouled duty-free spirit is, of course, much cheaper than ether prepared from spirit of wine on which duty has to be paid. The intention, however, was defeated, inasmuch as in the process of manufacture of ether from the fouled spirit, the fouling ingredients (*i. e.*, the methyl products) are destroyed. Thus, contrary to the general belief in what is commonly called "methylated ether" being as nasty as the methylated spirit which is used for lamps and for polishing purposes, "methylated ether" is to the taste hardly discernible from pure sulphuric ether. This so-called "methylated ether" is practically undistinguishable from *ether* (B. P.) at the specific gravity of .717, *i. e.*, when purified. At any other specific gravity, an odor is given off after evaporation. Practically, one cannot discriminate between the ethylic and methylic productions.

Price.—The ether thus prepared from the duty-free spirit (sp. vin. rect. *cum* methylic alcohol), can be produced at as low as one-seventh of the cost of ether prepared from the duty-paid spirit, the latter being bought wholesale at \$1.25 per lb., and the former at as low as 16 cents.

HOW PROCURED.

Ether is imported mostly from England, partly from Scotland, by larger chemists and druggists

in the principal towns of Cookstown, Maghera-felt, and Maghera. The large dealers supply small shopkeepers, and also cottagers, who sell in "draughts" (rather less than 2 teaspoonfuls) for one penny. The small shopkeepers also supply the hawkers (who are very often women), who attend fairs and other festive gatherings to dispense the "draughts" of the liquid poison. These "draughts" are also to be had from the surgeries of some medical practitioners, and in cottages or ether shebeen, where the cottager keeps a pig or two, and sells ether, the country people frequently giving potatoes, meal, or other produce in exchange. The hawkers carry about a bottle of ether, and do not scruple at selling to any one, however young, bartering a little for one or two eggs. In this way the children may procure the ether on their way to school.

ETHER PHENOMENA.

Intoxication by ether presents one distinguishing feature as compared with alcoholic intoxication. The phenomena are practically alike, but in rapidity of manifestation, alcohol is "nowhere." Indeed, in this respect, ether beats the record. There is the exhilarative stage of morbid exaltation, when the fun and exuberant merriment, the latent and ineradicable impulse of one "spoiling for a fight" of the genuine Irishman stands revealed in the twinkle of the eye, and the flourish of the shillelagh. The pleasing but quickly vanishing whirl of enjoyment is followed by an evanescent episode of brain disturbance and mental riot, with muscular paralysis and incoördination. To these succeeds the concluding comatose stage, when the patient is said to be "dead drunk." The shortest period in which I have seen this inebriate panorama move on till it swung round to recovered sobriety has, with alcohol, been six hours. With ether, I have witnessed the entire revolution in less than two hours.

In my observation an alcoholic inebriate career, from start to a fatal finish, has in America been, on an average, one-third of the duration of a corresponding career in Britain. So, curious to say, has the length of an ether intoxicative paroxysm been one-third the length of an alcoholic intoxicative paroxysm. Thus the etherist can have three thorough "drunks" for one of the alcoholicist. Herein, in addition to the greater cheapness, lies the superior claim of ether to the "greedy for intoxication," the true "narcomaniac."

Intoxication by ether may be described as "hysterical," and intoxication by ether *cum* alcohol as "maniacal." A man arrested while drunk on ether alone, would probably be quite sober by the time the constable had him at the police station, which might be very awkward for the constable, though the arrest had been made

when the man was in a frenzy of boisterous excitement. Several deaths from ether, and ether *cum* alcohol, have occurred.

PATHOLOGY.

Little is known of the pathology of ether. The habit has been too young to afford opportunities of much post-mortem examination of ether inebriates. Premature old age, an antedated shriveling up of the living frame, attests the poisonous influence of the destroying agent. Gastritis (acute and chronic), debility, dyspeptic distress, epigastric pain, pallor, tremors, timidity, moroseness, suspicion, nervous prostration, chilliness, a cyanosed or lemon skin, and an intermitting heart-beat, with exaggerated reflexes, are prominent symptoms. I have one such victim in my mind's eye now. Fawning, cunning, terror-stricken, this wretched medical colleague is the incarnation of utter misery. Not yet 40 years of age, he shuffles about like a worn-out old man of 90 after a wasted and mis-spent life. It has been urged by some medical authorities that ether is guiltless of producing any pathological lesion, from the almost lightning rapidity with which its inebriating manifestations appear and fade away, and from no serious morbid after-death appearances having been observed. This conclusion is, in my judgment, premature. Judging from the symptoms from which I have seen ether inebriates suffer, I have not the slightest doubt that ether has a pathological influence on various organs and tissues, and that, if ether drinking could boast of as venerable an antiquity as alcohol drinking, unmistakable lesions would have been but too manifest. What are the forty years of ether consumption by a hundred thousand persons, to the thousands of years of alcohol consumption by at least as many millions of human beings?

REMEDIES.

Happily, this new form of inebriation is but in its infancy, so there is some hope that its growth may be "nipped in the bud." As, in the conversion of methylated spirit into ether, the nauseous methyl products are destroyed, something might be done towards making the liquor loathsome to the palate by the compulsory addition of the wood spirit *after* the completion of the etherification, before the sale of the liquid. This, however, would be but a palliative, for I have had patients under my care who drank methylated spirit (some even from jars with anatomical preparations), and, in Edinburgh and Glasgow, Sunday drinking of this nasty beverage recently flourished apace. In a certain locality in the north of Ireland, the drinking of methylated spirit was introduced seven or eight years ago. At first confined to the very poor in a hilly district, it has spread rapidly, till now

farm laborers and farmers are daily indulging in it.

There are many inebriates who hate and abhor the taste of the intoxicant which, in their narcomaniac madness, they would barter their salvation to procure.

Another remedy would be the abolition of the retail sale. This would help by putting difficulties in the way of the drinker, but would only mitigate the mischief. Still more effectual would be the scheduling of ether as a poison, the sale of which is restricted to druggists under certain safeguards. This course was so readily adopted for Ireland by the British Government in January last, that I have yet hope the day will come when the more deadly allied poison—alcohol—will be placed in the same category, and so dangerous a drug will be relegated to the shelf of the apothecary, its sale hedged in with as stringent precautions as is now the sale of arsenic or prussic acid. But this halcyon era of prohibition will only be attained after a prolonged struggle, amid the howls and groans of an enraged liquordom, whose indignation is concentrated on all who attempt to "rob a poor man of his beer."

It is too soon yet to foretell the ultimate result of the bold step taken by our Government in scheduling ether as a poison, but it has made the procuring of ether for drinking purposes so difficult that for the present the sale has diminished by at least 75 per cent. I fear, however, that the cupidity of some wholesale dealers will incite them to risk the penalties of the law by surreptitious sales, which will speedily be ferreted out by the marvelous cunning of the diseased and demoralized inebriate.

The lines of sound treatment of ether inebriety; and of its prevention by law, must alike be based on an intelligent appreciation of the true character and etiology of ether drunkenness. This is, in reality, but a new manifestation of an underlying morbid condition which renders certain of the sons and daughters of men peculiarly liable to plunge into intoxication. We can never hope to succeed in the cure and prevention of any disease, until we first recognize the presence of the disease itself. The malady of narcomania, as subtle as it is far-reaching in its influence on body, brain and mind, and morals, is a legitimate outcome of natural law, and we will not be adequately equipped for the fight till we are thoroughly conversant with the laws under which every form of the disease of inebriety is developed and propagated.

A NEW REMEDY FOR WHOOPING-COUGH.—*onabaine*, in doses of about $\frac{1}{1000}$ grain. It has been tried with success by Dr. Gemmell, of Glasgow, and lately by Dr. I. L. Porteus, of Yorkers, N. Y.—*New York Med. Journal*.

SYNOPSIS OF OPIUM INEBRIETY; EFFECT, NEEDED LEGISLATION, DISTINCTIVE PLANS OF TREATMENT NECESSARY FOR THE SUCCESSFUL CURE.

Read before the Section of Medical Jurisprudence and Neurology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY W. S. WATSON, M.D.,

OF MATTEAWAN, NEW YORK.

Member of the American Association for the Study and Cure of Inebriety, of the Ninth International Medical Congress, of the American Medical Association, Dutchess County Medical Association.

He who has proven himself an attentive observer of the transactions of man for the past twenty-five years, does not hesitate to pronounce the last quarter of the transpired portion of the nineteenth century the most remarkable in the history of man. The philosopher, the scholar and the philanthropist, will be ready to declare that at no period, in all former times, have the intellectual energies of our race made so momentous discoveries, or put forth such exalted plans of benevolence for the benefit of mankind. The mighty achievements in the mechanical world have given new impetus to old powers and created new ones of vast results, profitable to us as a nation and as individuals. Revelations in language, in inscriptions, in customs and laws of nations have unfolded treasures of undoubtable excellence and worth, important in history, and eminently subservient to profound and philosophical investigation of man; while the knowledge now possessed of Nature and her laws, has enlarged the domain of humanity with results of vital importance. Learning is necessarily no longer confined to the favored few, nor is wisdom locked up from those earnestly seeking. Like the rays of the noon-day sun, intellectual light beams forth from almost every countenance; instruction is easily acquired by almost every individual; knowledge unfolds herself to every inquirer. Man is more and more aware of his capabilities. Onward, is the watchword, Progress, the spirit of the times. This is an age of investigation; the relation of cause and effect is sought; mind penetrates everything, theories of the past are being submitted to a more searching inquiry in the crucible of the present, new truths evolved, old ones confirmed; error and prejudice vanish before the judgment of this enlightened age; we live in an epoch full of change, live with conflicting opinions. Need we wonder at an obtuseness in the public mind in regard to the legitimate claims of the medical profession, a want of discrimination in recognizing the genuine, or an absence of veneration for the dictates of experience? It has been hinted already that the spirit of the age is one of reform. Social institutions, in jurisprudence, in our criminal legislation, and political economy,

leading minds are ardently at work advancing new theories; should not the same principle be made evident in our profession? Should so vital a thing as that of the public health be neglected, is it well that we look on with unconscious indifference at the warfare that is being waged on the life and health of untold thousands by charlatans and imposters, who vaunt their so-called cures broadcast through the medium of the press? The newspapers and periodicals are filled with advertisements skillfully designed to extort money from victims of the opium, morphia and chloral habit; you cannot pick up a paper, be it a religious or not, that does not contain their advertisements. How a Christian paper or journal can be a party to such a crime as that of helping these unscrupulous fiends to make capital out of the unfortunates that are addicted to the use of such drugs, is more than we are able to comprehend; the money to be realized from advertising for such imposters seems to crowd out all sense of right, hence the only way to overcome this evil is to enact such laws as will make it a criminal offense, punishable by imprisonment, to offer for sale any mixture or compound for the cure of inebriety, opium or alcoholic, into which composition opium or alcohol enter, or for being a party to the sale of such drug or compound, by advertising it or otherwise. Until such a law is in effect through the United States, opium, alcohol, and inebriety will hardly have a cure; there is no question but thousands are made mad by the vile stuff that is offered as cures for the opium and alcohol habit; if the compound of itself does no actual harm by reason of any powerful constituent, the disappointment, the blasted hopes that were so elegantly colored up by the advocates of the so-called cures is enough to set one crazy when he learns that his habit has only been fed. Legislation, and legislation alone can reach this species of fraud, once it is made a felonious act to sell or offer for sale, or advertise for sale any nostrum or compound until an analysis has been made by the State Analyst, and his certificate is attached thereto certifying that said compound does not contain any drug or combination of drugs that are known to enslave. Opium addiction: Is it on the increase? It may be said that opium inebriety is a disease of modern life, or recent origin. Opium eating, as it is called, has been practiced for centuries in the East; in China almost one-fifth of the entire population are addicted. Opium eating and smoking, strictly speaking, never prevailed to any great extent among Western nations until after the discovery of morphine in 1817. Since morphine has come to light it has made thousands of victims; especially has the habit increased with alarming rapidity since the hypodermic syringe came into use. To day, opium, in some of its forms, holds in bonds hundreds of thousands, yes millions of

the human race. We believe that there is no habit that is more pernicious to us, as a people or nation, than that of opium inebriety, for it takes possession more insidiously and holds on more tenaciously than any other known drug. The amount of opium coming through our United States Custom Houses, as reported, does not show an increase in the consumption of opium, during the past eight or ten years. There being no increase of imports does not conclusively show that no more opium is being consumed; legislation, increase of duty, has not shut out the supply. Some years ago Congress imposed a duty of ten dollars a pound on opium, with the hope that such duty would cause a decrease in the consumption of the drug; the effect has been an opposite one. The increase in price has been the means of a large amount of smuggling through various channels, the profits being enormous. Some statistician has calculated that the gains of English opium merchants in the last half century, exceeds two thousand million dollars. Large financial interests are concerned in fostering the opium vice in the United States, and here as well as in England fortunes are being made, by evading the tax imposed. We imported, and there was passed through the custom house, according to statistics of the Treasury Department, as follows:

In 1884, crude opium, 9 per cent. morphia, 264,746.15 lbs., for smoking 1,66,600 lbs., morphine 27,850.18 ounces.

In 1885, 351,609.15 lbs. crude opium containing 9 per cent. morphia, morphine 20,709.50 ounces.

In 1886, 351,193.11 lbs. crude opium containing 9 per cent. morphia, morphine 17,731.47 ounces.

In 1887, 468,153.13 lbs. crude opium containing 9 per cent. morphia, morphine, 14,431.00 ounces.

In 1890, 380,621.42 lbs. crude opium containing 9 per cent. morphia, morphine, 19,953.60 ounces.

It is estimated that during the year 1889 alone, there was something over 800,000 pounds of smoking opium alone smuggled into the United States, and there is every reason to believe that the amount smuggled in is perhaps double, when we consider the fact that every month three or more steamers arrive from China, at the western terminus of the Canadian Pacific Railway, at Vancouvers, most of them having opium on board. An average cargo, it is said, is about 25,000 pounds; a small amount may be retained for consumption in Canada, the remainder, it is said, is smuggled into the United States.

EFFECTS OF OPIUM.

There is a vast difference between individuals, not only as regards tolerance of such a poison,

but also as regards the forming of the habit; some temperaments fall almost immediately into the habit, others can use opiates for years and seem as free as though habit was an impossibility; we will, however, find victims among all classes. Morpho-maniacs include many of our literary men, mathematicians and scientists; medical men are more exposed to the formation of the habit than any other class. There is in his case what might almost be called a reasonable excuse for something which will quickly give relief from pain, if attacked, knowing as he does the undoubted effect of morphia to relieve pain; in his hurry, while others are calling upon him to help them, he may and often does insert or take a dose of an opiate. Business and urgent calls give him no time to consider his own case, or how often he has resorted to the remedy, and presently he finds he cannot throw off the craving, a need is implanted almost without his suspecting it. Thus thousands of physicians are made slaves to the opium habit, from which they cannot free themselves unaided, for he is himself no more, all is abnormal. The normal state with an opium-maniac is given in a few words: the will is paralyzed, his personality is destroyed. The opium habit is one difficult of eradication, the percentage of reformed drunkards is greater than that of opium inebriety; the drug opium long used becomes a necessity, and if withheld the whole system, every cell, cries out in agony, harmony of function can no longer be maintained without opium, the whole organism has been adjusted to the new or artificial condition in which the elements of equilibrium are in the poisonous drug. A sudden failure to supply the stimulus gives rise to an overwhelming craving, and plunges the individual into a trying ordeal from which there is no relief unaided, except it be by repetition of the poison and in increased doses. It has often been said by those having passed the trial of abstinence, that no one else but such can tell or give the faintest idea of the suffering or experiences when trying to abstain, without having been prepared for such withdrawal against their better judgment they are driven to madness, and as a rule they seek relief by returning to the accustomed drug. It matters not whether he may be, whether of the high or low, or of what caste, he finds he is indeed a slave to a habit over which he has no longer control; self control is a lost factor with him. Opium inebriety tell us but one story, that they are no longer free. Opium inebriety is truly a disease; there is brought about certain molecular changes, and a neurosis is produced amounting to a necessity for the continuance of the drug, until a preparatory stage is passed, during which sedative drugs are used and the system thoroughly aroused, reflex sensibility, or disturbances anticipated by such medication as will displace and tone up the pro-

alyzed functions. The mental faculties are among the first that suffer from the use of opium, as melancholia, hallucinations, especially of sight and of dread; sometimes the opposite is the case, instead of sadness or depression, there is excitement or mania, vertigo is common; with some insomnia is of frequent occurrence, perhaps wakeful all night and sleepy during the day. Sensation is generally impaired or perverted, in most cases there is a state of anæsthesia which largely accounts for the painless punctures with the syringe; upon the digestive organs morphia exercises, sometimes, a peculiar influence, if administered hypodermically it sometimes develops an appetite for a time, when if taken by the stomach, it destroys all desire for food, and not infrequently brings about nausea and vomiting; upon the bowels, the paralyzing effect is marked, a large proportion of persons are obstinately constipated while they continue its use, abstinence brings about diarrhœa; many patients are also troubled with dysurea, and only pass a few drops at a time, the kidneys seem to be paralyzed and do not perform their functions well; general nutrition suffers from the paralyzing influence. Those addicted to opium grow old fast, their eyes grow dull, face is without expression, skin becomes yellow and generally greasy.

Abstinence, there is a state of disquiet, an uneasiness, a state of agitation comes over the individual if his dose is long deferred and the system is long deprived of the stimulant, a sense of discomfort takes hold and he is restless and irritable. The highest effects of the abuse of opium are developed in the abstainer; among the marked symptoms are diarrhœa which can always be expected if the opiate is suddenly withdrawn, and if it does not come on, the patient should be watched, for he is probably deceiving you, jamming.

DIAGNOSIS.

You are generally struck by the strange appearance and expression of this class of people, the wan complexion, the vacant look together with a dulness, listlessness, with marked lowering of the physical as well as moral status, functions of nutrition are profoundly affected, with generally a loss of appetite and obstinate constipation; the most reliable method of diagnosis, and one that does not require acknowledgment on the part of the patient, is the examination of the urine; morphine is eliminated by the kidneys and can be found in the urine, and when found you are absolutely certain that the opiate exists. Examination from day to day is a part of my method for the detection of deceit on the part of the patient; of course it must be taken into account that the alkaloids of opium are not eliminated for some eight, or possibly ten days after commencing to abstain; by analysis of

the urine we have a certain means of knowing the condition of our patient.

TREATMENT, DISTINCTIVE PLANS.

There are some three or more plans or methods. First is the abrupt withdrawal or suppression, practiced by the somewhat noted German, Dr. Livinstine, and by many others after him. The plan is simply to take away the drug at once, without any preparation whatever. In regard as to dose; experience has taught thousands that the use of morphia or opium can not be suddenly stopped without serious results following. The abrupt withdrawal entails much suffering of mind and body and a risk of suicidal ending. Collapse is threatened on every hand; such a method is barbarous, uncalled for and inhuman; any one subjecting a person to such cruelties should be held for malpractice. Dr. J. B. Mattison, of Brooklyn, one of our ablest American writers, a man of considerable experience in this line has, upon several occasions, expressed himself as bitterly opposed to the abrupt withdrawal, and holds that no man is warranted in subjecting his patient to such torturing ordeals. We are aware that the Livinstine method has its advocates even to day, and some are high in the profession; we are of the opinion of Professor Bartholow, when he says one such an experience and he could not be induced to repeat it, if for no other reason than strictly humanitarian reasons, since the mental and physical sufferings are truly horrible. The dread of untold sufferings that one has to undergo keeps hundreds under the yoke of habit; the impression is broadcast over the land that to quit it is to entail upon themselves tortures beyond the endurance of almost any ordinary person. A second method is the rapid withdrawal, but not abrupt. Dr. Mattison advocates this method and it is generally a safe one to pursue. The plan consists of first producing a certain amount of sedation or control of the reflex irritation present. Dr. Mattison, in his monograph on the treatment of opium addiction, says the use of sodii bromide is, so far as he is aware, original with him in connection with the treatment of the opium reflex irritability; we have found in it the safest and most valuable sedative in such cases, for many years, our attention being first called to the effect of bromide of sodii and its probable action in the reflex disturbances following the withdrawal of opium from the human system by the late Dr. Beard. In using bromides to counteract, and to get desirable results, it requires large doses and for some days, from four to six days. The system needs to be constantly under the influence for such a length of time as named before an attempt is made to withdraw, in other words, the maximum sedative effect of the bromide should be secured by the time the maximum nervous dis-

turbance is expected or brought about by withdrawal of the opium. The rapid withdrawal is, in some respects, the most desirable of either the three plans. Sudden, rapid or gradual, better than the first from the fact that the system is saved the severe shock of the first and the necessarily longer time of the latter, and were it not a fact that many cannot even endure without severe trial and suffering under the rapid method, I certainly would rigidly adopt such a plan, but the gradual, with me, seems to meet more constitutional conditions than either. Gradual withdrawal is the easiest plan and the one most likely to succeed in the largest percentage of cases; it is to us the most logical from the very fact the habit is gradually formed, certain conditions and changes were produced gradually, therefore, it is rational to gradually withdraw or undo.

NECESSARY MEANS TO SUCCESS.

It is indispensable that the patient place himself under care of one familiar with the work, one that has studied the conditions that are likely to arise during the period of abstinence. Opium addiction, it matters not how used, produces radical changes in the system, a neurosis is produced amounting to necessity for the continued use of the drug, the demand for opium is so imperative as to place the consumer wholly beyond the power of resistance unaided. The principal difficulty we encounter in treating those addicted to the use of opium, is that they have lost about all their will-power, or self-control, in fact, confidence in themselves; they have a disease that impels an increase rather than power to diminish the doses, repeated attempts to abandon the use of opium has proved their utter inability to even diminish the dose; therefore there is but one road leading to a cure, and the only remedy or reasonable chance or plan that offers any assurance of a cure, is to place themselves under the care of a specialist in the work; in the hands of a conscientious practitioner who from contact, study and close attention to each patient's peculiar needs can best provide for every emergency, opium inebriety or eating, as it is called, is a vincible disease and curable, the person being otherwise constitutionally strong and free from organic disease, having an earnest desire to be cured; it matters little as to the extent or time used, nor need there be any dread of the hard ordeal to be passed through that has been pictured as worse than death; there are days of rational medicine, of humane and scientific methods. A special institution designed for such cases is the proper place, where appropriate arrangements are made for the care of each person, with provision for carrying out the best method for each particular case; certain symptoms and conditions have to be met promptly when they

do arise; in some instances a collapse condition threatens, which is best met by stimulants of ammonia or alcohol; in extreme cases a hypodermic dose of morphia may be a necessity for the time; delirium can be warded off by coca, chloral and bromides; if there is vomiting, omit food of solid character and give hot beef extract, hot milk, beef peptonoids (liquid form), medicine, ammonia ar. spr., bismuth sub. nit. Diarrhœa: clear out the prima-viea first by an emulsion of ol. ricine with spr. galci, then give bismuth sub. nit. and zinc sulph. carbolate. Pains in the legs treat by hot foot bath, massage and friction. Sleeplessness, restlessness: be sure first that your patient is not shamming, then give full doses of bromide, and sometimes ammonii valennate in the elixir form. Where sleeplessness comes without pain, I believe we have in the new drug, sulfonal, a most excellent sleep producing agent; being tasteless, is easy to administer. Sulfonal-bayer, is truly a hypnotic, in doses of from 10 to 20 grs. it does not derange the appetite or digestion, and does not seem to have any effect on the renal secretions, acts in from 1 to 3 hours and the effect lasts from 5 to 7 hours. In insomnia from pain it is of no value. From our present therapeutic knowledge of sulfonal we think it not advisable to give it in increased doses, from day to day, rather, if necessary, to give it nightly, in diminishing the doses. Codea is a preparation of opium that can be given to allay pain as safely as any of the opiates and without any great liability to formation of habit; in cases presenting an anæmic condition, iron and strychnine are proper. If any notable depression or prostration of any considerable duration, alcoholic stimulants are demanded. Restlessness and insomnia are frequently warded off by the hot bath before the hour of retiring. Electricity is useful in almost all cases and many times will tranquilize the system, especially the electric bath. Among the essentials that are positively needed if you would succeed, is mental quietude. Opium and chloral cases need be in an atmosphere of tranquillity, away from all exciting causes; live, diversions, pleasant company are desirable; the patient should first of all select a healthful place with cheerful surroundings as practicable, and above all, place him or herself in the care of one in whom they have confidence; once in the institution no more information should be imparted as to when or how they get rid of the opiate; the patient is one that uses the hypodermic syringe, a change must be made at once, the syringe must be discarded and all opium should be taken by the mouth.

THE College of Physicians of Philadelphia has awarded the Alvarenga Prize for 1891 to Dr. L. Duncan Bulkley, of New York, for his essay on Syphilis Insontium.

THE ABSENCE OF REASONABLE MOTIVE IN THE SO-CALLED "CRIMINAL ACTS" OF THE CONFIRMED INEBRIATE.

Read before the Section of Medical Jurisprudence and Neurology, at the Forty second Annual Meeting of the American Medical Association, Washington, D. C., May 6, 1891.

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"Motive" may be defined as that which actuates or influences, that which determines choice. It implies the presence of an unimpaired will power, at least one that is not so seriously impaired as to be incapable of volition, and actuated either by right or wrong desires.

Impulse is the sudden application of some powerful motive, that causes the will to act hastily without usual deliberation, or that exercise of the reasoning faculties that occurs when a purpose is deliberately formed. The genesis of impulse may be a good or evil motive.

In both instances either when the act results from the motive operating upon the mind through a deliberate and logical course of reasoning, or impulsively, as when the motive acts independently of, or supercedes and dethrones reason, if it attempts to assert itself in either instance, there is one *condition* that is common to both, and that always is present, namely, *consciousness of the act*. The person invariably knows he has performed the act whether the "motive" were good or evil, the result of deliberation or of impulse.

How often do we hear the expression, "what motive urged him to do such an act?" and if the person be in a normal mental condition the law, if the act involves a legal infringement, arrests and punishes the transgressor. But are these words applied to the acts of an insane person? Certainly not. All acknowledge that the will power in this case is held in abeyance in some instances, or permanently annulled in others in which the insanity is *incurable*. The actions of the acute or chronic insane are "senseless" and utterly devoid of reason; if a "quasi" motive is asserted it is insufficient, and as a rule ridiculous, incompetent to explain an act often involving matters of the greatest moment, even life itself. This is seen in certain forms of monomania. Thus the pyro-maniac sets fire to a crowded enement. Gives as a reason for his motive in so doing that he likes the excitement and confusion incident to such a scene; all other motives based on rational explanation being excluded, such an one would be regarded and dealt with simply as a person possessing a dangerous monomania, and demanding close confinement in an insane asylum. No one is held responsible for his acts, if he is incapable of exercising his will power, the ability to reason from cause to effect or discrimi-

nate between good and evil courses, and the consequences resulting from these.

Even in some forms of insanity where the will power and reason are not totally annihilated, the insane person capable of exercising a discriminating power to a certain extent, having at least a partial knowledge of right and wrong. Even in these cases the insane person is never legally *punished* although he may be disciplined by "institutional forms of correction;" this treatment is much the same as a child, who has not yet arrived at the years of discretion, and is still subject to his parents; the parent may correct the evil doer of tender years, yet the law will not punish such an one.

The law recognizes this fact, the absence of full responsibility among the more youthful class of criminals, and among the "criminal insane," so-called. In the former instances the State establishes "Reformatories," in the latter, an asylum for the "Criminal Insane." But while the insane, the imbecile, the idiots, and those of tender years, have thus been leniently dealt with, by some strange, illogical process of reasoning, or by actual indifference to the facts of the case, the confirmed inebriate has been excluded from all these benefits, and moreover, his inebriety has been regarded not as an extenuating circumstance, but rather as an aggravation of his so-called criminal act.

Are his acts rational? Are they based on a reasonable motive? are they the result of a well-balanced mind? is he always even conscious of the acts he performs? Analyze the acts of the confirmed inebriate and you will find that they are the acts of an *insane person*. Insane from the temporary or habitual use of alcohol.

If we can show that in the majority of cases, in the acts of the confirmed inebriate there is absence of proper motive, absence of intelligent impulse, absence even of consciousness of the act in some instances, ought he not to come under the benefits of that unwritten or recorded law which excludes from penalty the insane or those of an irresponsible age, and does not hold them responsible for their acts?

It has been abundantly shown, particularly by the researches of Dr. T. D. Crothers, that amnesia, partial or complete, is the mental condition of the average confirmed inebriate. If the loss of memory is complete, he becomes a veritable automaton; his movements are mechanical, devoid of thought or reason, and he is therefore unconscious of his acts; under this condition what he does may be ridiculous or even dangerous. His actions are similar to those of a somnambulist who, walking in his sleep, performs deeds of which he is totally unconscious when awakened. The acts of the confirmed inebriate are thus often performed unconsciously, and when he comes out of this "trance state," so-

called, or condition of cerebral automatism, he has not any knowledge of what he has done, and yet oftentimes there is a seemingly rational action on his part, and his condition may not be detected, because not suspected, by those with whom he is brought in contact; while in this condition the inebriate may commit acts that are criminal.

Mendacity has been set down as one of the prominent characteristics of the inebriate, but I am convinced that the denial of the inebriate of the statements he has previously made or the acts he has done, when confronted with them, is often due to his utter unconsciousness of ever having made such statements or performed such acts.

The "testamentary capacity" of a confirmed inebriate should be excluded on this ground, and no "confirmed inebriate" should be empanelled in any jury, nor should his testimony as a witness be received in any court.

The validity of the signatures of confirmed inebriates, to wills, contracts, or affidavits should always be questioned if allowed, and "marriage" contracted under these conditions should be annulled. I am acquainted with an instance in which the confirmed inebriate was a young man of wealth, who contracted such a misalliance. The validity of the marriage was not questioned on the ground of the avoidance of publicity, and the woman, whose sole object was money, finally consented to relinquish her claim for the sum of twenty thousand dollars. Now I maintain that such a marriage was not valid, and would not have been recognized in legal courts.

Not only in the trance state, where consciousness seems to be annulled, and the memory temporarily abolished, may the inebriate perform acts that he is totally unconscious of as a somnambulist or automaton, and thus render himself liable to criminal procedure, or the subject of fraud on the part of others.

But there is under this condition a tendency to repeat the crime or act he may have been previously guilty of, a *monomania*, so to speak, for a special act.

Dr. Alex. Pudden of Edinburgh, reports the following cases:

At the prison of Perth, one woman was committed 137 times for being drunk, *her invariable practice was to smash windows*. A man when drunk stole nothing but bibles. Another stole nothing but shawls; another shoes. A man was transported for stealing tubs on seven different occasions; with one exception he was always guilty of tub stealing. Others have been repeatedly convicted of horse stealing.

In others the destructive tendency is marked; to pull down and destroy, unusual prodigality and waste, such as scattering money in the street, or throwing it in the fire. Such persons are notorious for "cleaning out" a saloon, smashing, break-

ing and throwing out on the street articles of furniture, etc. There is not any "reason in the madness" of these temporarily insane inebriates. Their actions are "motiveless." The whole machinery of the will is out of order, the power of coördination of the faculties is lost, hence all acts are erratic.

In addition to the "trance state" and "monomaniacal acts" of the confirmed inebriate, there is another condition under which the inebriate may perpetrate higher grades of crime. We refer to that condition where the prominent characteristic of the insanity of the inebriate, is the monomania of suspicion or persecution, a condition not uncommon in the confirmed inebriate. Under this condition the inebriate is morose, taciturn, secretive; if he communicates his suspicions to any one, it is only occasionally and with great reservation. He imagines that enemies are trying to poison him; he hears voices in the air; he is followed, and in danger of being waylaid, or his wife is unfaithful to him; suspicion of "marital infidelity" is very common in these cases. Robbery, mutilation, murder, every possible contingency that may happen to a person, are imagined by these insane inebriates, as being applied to their case.

Acting under erroneous suppositions, they prepare themselves for the imaginary danger, or assault those whom they believe would injure them; or take vengeance on the innocent wife whom they judge guilty of marital infidelity. Oftentimes their mental condition is not suspected, and oftentimes only after they have wreaked their insane fury on those about them.

And just here in parenthesis we would remark that though the acts of the *confirmed inebriate* may fill every grade of crime, from petty theft to homicide, yet those criminal acts which call for shrewdness, mechanical skill, involving as they do the maturing of long continued plans, well laid, and aptly executed, as professional burglary, systematic forgery, etc., the confirmed inebriate is incapable of.

The burglar and the systematic forger may drink liquor, but they have the fullest exercise of their mental faculties, and the ability to use liquor moderately, so that their hand is steady, their nerves unflinching, and their reason unclouded. This is the universal testimony of the governors or wardens of penitentiaries and prisons in America and Great Britain, and hence is the great distinction between the so-called "criminal inebriate" over the professional criminal. The confirmed inebriate acts without motive without the deliberation, without that usual caution and concealment that characterizes the criminal who is in a normal mental and physical condition.

Hence the insane inebriate, the subject of the monomania of suspicion or persecution, is easily

traced to the act committed by him, and his attempts at concealment, if made at all, are illy disguised. He is not an assassin, striking from the shadow and then disappearing. His acts are often in the open day and the most conspicuous public places.

Let me cite a prominent example or so that may more forcibly illustrate this class of insane inebriates. And these cases will also partially illustrate the acts of the inebriate epileptic—different only in this, that the prodromata or period of incubation is longer in the inebriate having the monomania of suspicion or persecution, than in the epileptic inebriate. In the latter, the act occurs as the coma following the convulsion had passed off. The latter class are the most dangerous of all insane inebriates, for they add to the insanity of epilepsy, that also which alcohol begets. The following cases are instances where the characteristic type of the insanity of the inebriate was the "monomania of persecution" or of suspicion.

Case 1.—"The patient is 43 years of age, has been drinking to excess for several years past, is insane. The insanity is the direct result of his excessive use of alcohol—there is not any hereditary taint. His insanity lasted about a year; he recovered and resumed his business, only to relapse, and is now drinking harder than ever. The immediate cause of his relapse was a sprained ankle, from which he suffered very much. His insanity at all times is that of the 'monomania of suspicion' or 'persecution.' His suspicions are mainly directed towards his wife and child. He walks about the house, and if he had his full liberty, would no doubt assault them, for it was found before his condition was fully ascertained, that he had concealed, under the stationary washstand of the bedroom occupied by himself and his wife, a dirk knife, which was covered with some old clothes." (Reported by Dr. I. E. Lester, *Journal of Inebriety*, Vol. vi, p. 32.)

The following case was reported by Dr. Drake, of Cincinnati, O., and was published in the report of the New York State Inebriate Asylum for 1866, the late Dr. I. E. Turner, Superintendent. At the time of the occurrence, it attracted the attention of the medical public in its bearing on the legal responsibility of the insane.

"John Birdsall, of Harrison, in that State, was indicted in 1829 for the murder of his wife with an ax, by dividing the spinal column in the neck. He was about 50 years of age, had been married to this his second wife nineteen or twenty years, and had children by her. For some years previous he had been subject to fits of intoxication. These, of late, were followed by delirium tremens, which generally lasted several days. In these paroxysms, he entertained great fears for his safety—ran about the village as if attempting to escape pursuit. At another time he con-

cealed himself between a straw bed and a feather bed in his own house. He would point his gun from a window, as if for defense against imaginary persons. He was also very watchful.

"The prevailing maniacal delusion was that his wife was in combination with his neighbors, and his son by his first wife, against his life. He had charged her, during his paroxysms, with criminal intimacy with these, and had threatened to kill her on Sunday. He was intoxicated Monday, Tuesday and Wednesday. On Wednesday evening, he complained of being unwell, but seemed to be rational. He slept none that night, and next day the family thought him crazy, but were not alarmed. In the course of the day he took an ax and went to a neighbor, whom he desired to return with him, as he stated they wanted to kill him (monomania of persecution). He spent the remainder of the day at home, apparently in terror and agitation, manifested jealousy of his wife, barred the doors, and fancied that the person of whom he was jealous was manufacturing ropes up stairs to hang him. In the course of the afternoon he suddenly committed murder. His wife was sitting by the fire, and he walked into the room. After the fatal blow on the neck, he followed it by two or three on the face. His eldest daughter seized the ax, which he yielded, but took a scythe and attempted to strike her. She defended herself until the door was opened. When arrested, he acknowledged the homicide, and knew, he said, that he would be hung, and regretted that he had not done it sooner. After being committed, he became regular, and expressed sorrow for what he had done. On trial, three medical witnesses agreed that he labored under *mania à potu* when he committed the homicide.

"For the defense it was urged, that when *drunkenness gives rise to insanity*, it should cause immunity, and hence form a legal excuse. On the other hand, the counsel for the people remarked 'that Birdsall knew that his delirium followed his intoxication, and hence it was voluntary.' The law therefore held him accountable for actions during such a state.' The verdict was murder in the first degree, and he was sentenced to death." It is needless to add that there was not the slightest foundation for the insane vagaries of Birdsall, and no "reasonable motive" for his act.

Let me cite still another case, reported as a newspaper item. "Alexander C. Wingate, a wealthy resident of Woodford Co., Ky., was shot dead at about 4 o'clock this morning (March 29, 1882), on an Ohio and Mississippi train, near Mitchell, Ind., by a man named Haynes, who was crazed by drink, and had no provocation for the shooting.

"Mr. Wingate was returning home from a business trip from the West, and was in a sleep-

ing-car. Haynes entered the car, laboring under great excitement, and said to the porter and several passengers that he had been followed by thieves from San Francisco, who were bent on robbing him (mania of suspicion). He begged the passengers to keep his money—which amounted to only \$90. The porter tried to pacify him, but he grew more desperate, and flourished his revolver around wildly. The train men were either too cowardly, or did not have sense enough, to wrest the revolver from him, and eject him from the train.

"At this time, Mr. Wingate stepped from his berth. Haynes immediately confronted him with the revolver, and exclaimed, 'Give me my money,' and fired. Wingate threw up both hands, cried 'I am shot,' and sank down dead. The maniac (from alcohol) turned, and fired two random shots, then darted past the passengers and out of the car door, and jumped off the train, which was running at the rate of 45 miles an hour. He landed safely, walked half a mile to a creek, stripped himself naked and jumped into the stream. His dead body was found there this morning. His clothes were found hanging to a tree 100 yards distant, and they contained \$90 in gold, a gold watch, an express receipt for \$400 sent from El Paso, Tex., to New Salem, O., and a quart bottle of brandy, half full. In his valise was found a gambler's 'lay-out.' Haynes is from Yuma, Ariz. He was evidently laboring from delirium tremens (?) at the time of the deed, or rather '*mania à potu*.'"

Although homicide was the prominent feature of the case, "homicidal mania" was not. Haynes did not kill Wingate because a predisposition to kill some one predominated, but as an act of supposed self defense, and to resent the injustice that he supposed Wingate had inflicted on him. In other words, the "mania of persecution" was the leading form of insanity—a form very common in cases of insanity arising from alcohol.

There is no crime in the calendar that these alcoholic maniacs may not commit. Their reason is temporarily dethroned, they are unconscious of not only the character of the act, but of the acts themselves, and are therefore irresponsible. The following case shows the complete annihilation of all mental and moral responsibility.

"A young man in Madison Co., in this State, in the year 1859, was attacked with alcoholic delirium for the third time. While under the attack, he killed his father and mother, cut out their hearts, which he roasted and ate. He was arrested, thrown into prison and indicted for murder. He was brought into court for trial, when Judge Gray, of the Supreme Court, stated that the case could not be tried, '*as there was no motive to prompt a man to commit such a crime.*' This man was sent to an insane asylum."

Let me cite a case taken from the records of

Broome County Circuit Court: "On Decoration Day, 1885, George Axtell, a young farmer of the town of Middletown, New York, visited Deposit village, and became intoxicated. While in this condition, and without provocation, he ran amuck (a mok) with a pistol and killed three men. Axtell was condemned to be hanged, but died in jail of heart disease, prior to the date fixed for his execution, or we would have had to record another case of judicial murder."

Axtell was undoubtedly affected by "*mania à potu*," or "alcoholic frenzy" or mania, when he committed the homicides, and was entirely irresponsible. These cases of "alcoholic homicidal mania" are not uncommon, and the daily prints often furnish us with similar examples.

I might cite many cases in point showing the various kinds of alcoholic insanity, and the crimes committed, as well as the judicial opinions expressed, but let these suffice.

The question whether "premeditation" could be proven in the case of the criminal inebriate could not, we think, weaken the position taken of the irresponsibility of the inebriate. In some instances apparent premeditation may exist; but the absence of a "reasonable motive" should certainly give force to the plea of irresponsibility.

The popular impression seems to be, testified by Mr. John C. Salter, the warden of the State penitentiary at Chester, Illinois, that a criminal is necessarily a drunkard.

The large proportion of criminals, such as burglars, forgers and counterfeiters, need clear brains, steady nerves, quick perceptions, to carry out their plans, which would be impossible under the influence of intoxicating drink.

The assassin may drink to nerve himself for the deed, but only to that extent, and no more. This form of crime, where the alcoholic stimulant is taken *deliberately*, with the intention of nerving the criminal to the act, is most aptly shown in the great Shakespearean tragedy, *Lady Macbeth*, so stimulated and nerved as to become an accomplice to Macbeth in his bloody deed, the soliloquizes:

That which hath made them drunk hath made me bold.
What hath quenched them hath given me fever.

Here the antecedents, the motive and the subsequent events of the plot take precedence, and the alcohol taken within to produce drunkenness—not lethargy—plays but a secondary and inferior part in the whole tragedy. The "deep damnation of the taking off of Duncan" is not lessened one whit by the fact that alcohol was used to nerve the conspirators and murderers to nerve themselves for the tragedy. The alcohol did not prompt the deed; it was deliberately taken to enable them to perform it—a condition quite the reverse of the insane inebriate or the person suffering from "chronic alcoholic mania," in which the "mania of suspicion," or an acute alcohol

mania is developed. Here the maniac, in his sudden fury, cyclonic in its violence and rapidity, kills those nearest to him without premeditation or motive.

To sum up the logical conclusions resulting from the study of criminal inebriates in a single paragraph, we would state:

"An act, to be criminal, and to be enrolled under the code as a crime, must show such pre-conception, or preparation, or motive, as to make it an act of deliberation, and the intent must be proven by the relation of the accused party to the deed, before, during and after its commission.

"If from simple impulse, without premeditation, the act must be shown to have been uninfluenced by any drug capable of affecting the intellect and developing maniacal impulses; and further, that the person committing the act was in full possession of his mental faculties, and was uninfluenced except by a reasonable motive that prompted the deed. In special cases, as in murder, the ground of self-defense may satisfactorily be excluded. Under these circumstances, the person has committed a crime, and the evidence must acquit or condemn him."

In all cases, a history of previous *confirmed inebriety*, coupled with an entire absence of *reasonable motive* or antecedents, should give the person committing the act the full benefit of the plea of irresponsibility, and the same "legal excuse" that is applied to the acts of "insane criminals."

And in conclusion, I have only to add that the "criminal inebriate" should be dealt with in the same manner as the "criminal insane."

HOW MUCH OUGHT A SMALL CITY TO PAY ITS HEALTH OFFICER?

BY HENRY B. BAKER, M.D.,

SECRETARY OF THE STATE BOARD OF HEALTH, LANSING, MICHIGAN.

[From advance sheets of "Proceedings of a Sanitary Convention held at Negaunee, Michigan," August, 1891.]

I presume that the reason why each city is required by law to have a health officer, is that sentiments of common humanity dictate that proper effort shall be made, constantly, by the officers of every locality, for the best possible protection of human life and health within their jurisdiction.

But in this paper I propose to go a step further, and to point out the fact that this high humanitarian position which the law contemplates, when it requires cities to guard the health of their inhabitants, and to contribute facts and statistics for the general welfare of the people of the State, that all this from a financial stand-point, pays the people of each city and of each locality. I propose to speak especially of the city of Negaunee, but the same principle which applies to Ne-

gaunee is applicable to other cities and localities.

Let us estimate the population of Negaunee as about six thousand, and that the death rate in Negaunee is about the same as it has been in other parts of Michigan where it was not specially influenced, say about seventeen per thousand inhabitants per year. Then, the average number of deaths in Negaunee per year would be about one hundred and two. Of this number, a little less than twelve per cent. would be from consumption, six and a half per cent. from diphtheria, two and seven-tenths per cent. from scarlet fever, three and two-tenths from typhoid fever. These are all communicable diseases, and they are preventable through measures which are now known to health authorities.

Reliable statistics, collected by the Michigan State Board of Health, have proved that (even after the disease is introduced) about seventy-five or eighty per cent. of the deaths from diphtheria and from scarlet fever are prevented if complete isolation of all infected persons is enforced, and there is then thorough disinfection of all infected substances.

I believe that there is a similar saving of lives from loss by typhoid fever, where the proper local health measures are enforced. Relative to typhoid fever, these measures are not so completely dependent upon efficient services by a health officer as are those relative to diphtheria and scarlet fever, yet they will not be likely to be effective except such services are maintained.

It is possible then, through and in connection with the services of an efficient health officer, to save, in a city the size of Negaunee, in each year, the lives of about five persons from death by diphtheria, about two persons from death by scarlet fever, and, I think, about two persons from death by typhoid fever. In some years they might be more, and in some years, less; but these are the average figures per year, for a series of years. Surely the saving of these lives, and of the sickness of the still larger number of persons, is well worthy the effort of the city in compliance with State laws. But I wish to point out the fact that in saving those lives, and in the lessening of sickness, there is saved to the city that which has cost money, and that which if lost, would have been a loss in money values far in excess of the cost of any effort which the city puts forth in sustaining an efficient health service. It costs money to raise up children to the age when they become producers of wealth. If children are permitted to die of communicable and preventable diseases, there is a great waste not only in life, health and happiness, but also in money. Statisticians have computed the average value of an adult person, for what that person will earn in excess of cost of maintenance, as about one thousand dollars. Practically about the same conclusion was reached by those in the

south, who some years ago bought and sold slaves, a good one selling for about eight hundred dollars.

If, now, we consider that the seven persons in Negaunee in each average year, whose lives should be saved from diphtheria and scarlet fever, are each worth five hundred dollars, there is in each year a saving of three thousand five hundred dollars from those two diseases alone. If two lives are saved from typhoid fever by disinfection of infected matters, and by other methods which a good health officer could teach, the persons saved from that disease would ordinarily be in the prime of life, and this saving should be counted as two thousand dollars.

There is, then, a probable saving of \$5,500 a year in Negaunee, by such work as can be and should be done by and in connection with the services of an efficient health officer, and this with reference to only three of the dangerous communicable diseases. Of course, I believe that lives can be saved from other diseases than those in which I have just computed the saving, but I have omitted most of them because not needed in my argument, and I have selected the three which I mentioned, because in diphtheria and scarlet fever we have the absolute proof that lives can be saved by measures that are well known to us, and in typhoid fever it has been proved beyond question that the disease can be almost entirely prevented by other measures which are equally well known.

In this brief statement of facts I have omitted all consideration of the costs incident to sickness, including physicians' compensation, medicines, nurses, loss of time, etc., also the cost for funerals, and have confined myself rigidly to the money losses through the actual deaths from three diseases. Without the efforts which I have supposed to be put forth by an efficient local health service, there is a money loss in a city the size of Negaunee, through the actual deaths from those three diseases, equal to \$5,500 per year. Is it not better and really more economical to pay \$5,500 per year for public health service than to bury that which is equal to that amount in money value in the graveyard?

I am ready to admit that this counting of the cost of the life blood of your neighbor and perhaps of yourself; of your neighbor's child, perhaps of your own child, is to me exceedingly repugnant; but so long as your neighbor's life and your own, the lives of your neighbor's children and of your own, are not properly guarded, but are permitted to be endangered from these same diseases that I have mentioned, it is plain that some other argument than the usual one must be presented.

Undoubtedly, public-health work in cities is neglected because of lack of information as to *how much* effort should properly be expended.

Such computations as those I have put before you should help us to arrive at conclusions on this point.

We will admit, if you please, that when deaths occur, the loss is not equally distributed among the people of the city; generally the loss falls most heavily upon the bereaved family, and this is especially true if the death is of the breadwinner of the family. But it should not require much argument to show that the prosperity of a city depends greatly upon its healthfulness and the safety of life therein, and that, in a long series of years, the deaths are distributed somewhat equally among the people, and that, even if they are not equally distributed, a high moral sentiment should prompt us to guard the common safety of life among us. It was recognized, even before the Declaration of Independence, that to each citizen the right to exist, the life of the individual is among the inalienable rights to secure which "governments are instituted among men." It is plain, therefore, that one of the highest, perhaps the very highest, function of government is to guard the lives of the people.

Having reference, then, to only three important diseases, it seems plain that a city the size of Negaunee has the undoubted right to expend in every year at least \$5,500 for the restriction and prevention of diphtheria, scarlet fever and typhoid fever. I think that there is good reason to believe that the citizens of Negaunee would make money by this work; because they would incidentally save lives and cases of sickness from other diseases than those I have mentioned; and, besides, in my account of the losses by those three diseases, I accounted only for the losses by reason of the deaths, leaving out of the account all the great expenses for the sickness. For instance, from the two diseases, diphtheria and scarlet fever alone, an efficient health service, properly supported, should in each year save all the expenses incident to forty-three cases of dangerous sickness.¹ All such saving would be a clear profit, in case the city expend the \$5,500 per year, as previously suggested, and save \$5,500 worth of lives, as I have shown may reasonably be expected.

I would advise that at least \$1,000 a year should be expended toward securing a water-supply which is above suspicion. This with special reference to the prevention of typhoid fever. I would use another \$1,000 per year toward securing good sewerage, and a proper disposal of waste. Five hundred dollars would

¹ The reports, compiled by the Michigan State Board of Health, show that for each death from scarlet fever there are over ten cases of sickness from that disease; that for each death from diphtheria there are four cases of sickness from diphtheria. Therefore, the seven deaths on an average yearly from diphtheria in the average place the size of Negaunee should represent twenty-eight cases of sickness, and the three deaths from scarlet fever represent thirty cases of scarlet fever—fifty-eight cases from the two diseases; and, inasmuch as 75 per cent. of them should be prevented by an efficient health service, forty-three of the cases should not occur.

pay for disinfectants, for printing annual and other reports of sanitary officials, including the water and sewerage commissioners, and for other incidental expenses. This would leave \$2,000 per year with which to pay the salary and expenditures of the health officer.

The law now requires much more of the health officer than it formerly did; and it provides fines and imprisonment for neglect of duties connected with dangerous diseases. If the health officer attends to such diseases, he must lose his ordinary practice. Accordingly, his compensation should be greater than formerly; it should be greater than he could obtain for the same time by the regular practice of his profession as a physician. The life and health interests of the whole people of a city are of more consequence than those of the patrons of any single physician, no matter how large and lucrative his practice may be. But there is another still more important consideration. No reputable physician claims to *cure* any real specific disease such as diphtheria, scarlet fever or typhoid fever. After a person has contracted the disease, it is important to have a skilful physician to watch and guard the patient as thoroughly as possible through the course of the disease, but no physician claims to stop or break up the course of the disease. Physicians are needed to lessen the chances of death among those who have been permitted to contract these preventable diseases. The truest economy consists in lessening the chances of contracting such diseases. The compensation to physicians should be for the prevention of all such diseases, then it would not be required for the cure, during which a large percentage of the cases prove fatal, and this under the best methods of cure in the hands of the most skilful physicians. About the only practicable method of transferring the compensation to the proper kind of service, is to employ the physicians as health officers and as members of local boards of health.

In many places the people are so ignorant on these subjects, that they do not provide sufficient compensation to induce the best physician in the city to act as health officer, and to give his whole time to the public service. It is noticeable that it is in just those cities which do not sustain an efficient board of health, and do not constantly employ and pay for the services of a first-class health officer, that the dangerous diseases are so destructive. I am informed that here in Negaunee, the health officer receives from the city only \$500 per year. That is for guarding the interests of the health and life of all the 6,000 people in the city. At the same time there are in Negaunee six or more physicians, who are paid and well supported, each attending to the sick among only a portion of the people of the city.

I fear that the saving of life and treasure which I have computed as possible has not all been

made in Negaunee, but I look forward to a time when, through the payment of a few thousand dollars per year for a complete and efficient health service, there will be saved the lives of even more than the nine persons whom I have computed should be saved from diphtheria, scarlet fever and typhoid fever, and to a time when Negaunee shall have become one of the favorite summer health resorts of those who every summer seek to avoid the heated atmosphere of localities farther south.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

Section on Orthopædic Surgery.

Stated Meeting, October 16, 1891.

SAMUEL KETCH, M.D., CHAIRMAN.

Dr. Royal Whitman presented a patient illustrating the application of a brace for the more perfect fixation of the spine in disease of the middle dorsal region. The appliance consisted of two saucer shaped pads covering the prominence of the shoulders, connected by an unyielding steel bar, passing across the chest; and two triangular hard rubber pads covering the lower two-thirds of the scapulæ, connected by a steel bar. The Taylor back-brace was applied as usual, and the back bar attached to its upper portion. The shoulders were then pressed back to their full limit, the front pads placed in position, and firmly attached to the brace by straps passing above to the neck bar, and through the axillæ to the back pads which held the scapulæ against the thoracic wall. Motion of the spine was thus confined entirely to the neck. Although the necessary movements of the arms were not restricted, forward reaching movements, which were always accompanied by flexion of the dorsal spine, were entirely prevented. This principle, the restraint of certain movements of the arms which tended to increase the existing deformity, was the point to which he wished to call the attention of the Society, as he was not aware that its importance had before been insisted on.

Dr. R. H. Sayre fully agreed with Dr. Whitman as to the necessity of keeping the shoulders back in this class of cases, but the difficulty hitherto had been to maintain such apparatus in proper position. In a paper which he had read at the recent meeting in Washington, he had called attention to the fact that when the disease was situated high up in the dorsal region, the plaster of Paris jacket did not give proper support, because it failed to hold the shoulders back, and that in such cases, he was in the habit of employing pressure backward on the tips of the shoulders.

Dr. Newton Shaffer thought that the apparatus exhibited acted admirably in fixing the shoulders, but it was open to the grave objection that by exerting pressure on the scapular plates in this way, the uprights are prevented from exerting the proper amount of pressure at the seat of the disease, and so the apparatus was not able to arrest the traumatism of respiration. He thought this was a defect inherent in the apparatus, and not, as Dr. Whitman believed, simply an accident, due to improper fitting of the brace to the patient's spine.

Dr. Whitman replied that he thought the apparatus exerted all the pressure that the skin would bear, and that by slightly modifying the curve of the uprights, the defect noticed by Dr. Shaffer would disappear. His object in presenting the apparatus was to elicit a discussion on the question, whether or not it was desirable in this particular class of cases, to attempt to control the forward movement of the shoulders.

BOND'S OPERATION FOR TALIPES VALGUS.

Dr. A. M. Phelps presented a young man whom he had been treating for a number of years for a very severe case of talipes valgus. Almost all methods had failed to give more than temporary relief, although in one instance there was no relapse in the case for a whole year. The patient constantly wore a support for the arches during the time.

The patient sought for relief not so much on account of the deformity, as because of the severe pain which he suffered, and which prevented him from standing on his feet; without shoes, he could hardly walk. His occupation was printing.

In conversation with Dr. Bond, of Westminster Hospital, London, Eng., Dr. Phelps had learned of the operation, which in its author's hands had been successful.

The operation performed by Dr. Bond was for the purpose of relieving the pain, which it certainly does. He alluded to the operation as "firing," the same as is done for the relief of spavin in a horse.

The operation consists in making transverse incisions with a Paquelin cautery, beginning at the inner malleolus, and extending one-third of the distance across the sole of the foot, cutting through the cellular tissue down to the muscles. About four of these incisions suffice. Two semi-circular incisions are made, crossing the transverse ones. It seemed to Dr. Phelps that if the arch of the foot, before the operation is performed, were well shoved up in place, and held with plaster of Paris for a few weeks, that the shortening of the tissues in the sole of the foot by cicatricial contraction, would be more effectual, and would hold the arch in the normal position.

The operation when applied in this manner

for the purpose of shortening the girders of the arch of the foot, is identical in principle with an operation which Dr. Phelps performed and reported to the American Orthopedic Association in 1889.

One objection which has been urged against the open incision method for talipes equinus, is that the scar is quite likely to be sensitive, and it is interesting to note that in this case, the amount of the scarring being considerable, the patient walks upon the scarred tissues without any pain, and is able to work at his trade. The only support to the foot needed, is an ordinary shoe slightly thickened on the inner side.

Dr. R. H. Sayre said that the amount of pain experienced in these cases of flat foot bears no relation to the amount of deformity. This patient's foot is still turned outward, and as in many other cases, when the foot is brought into the normal position, there is a very noticeable involuntary twitching of the peroneal muscles. The patient had been made comfortable once before for a period of a year, so that it was entirely too soon to say that the case would not relapse. As the arch of the foot is in large part maintained by the deeper structures, it seemed doubtful whether the scar tissue, which did not go beneath the muscles, would be sufficient to hold up the arch, although at present it did this very well.

Dr. A. B. Judson said that in view of the well known fact that cicatrices after burns contract persistently and with great force, the operation was not only ingenious but quite likely to prove successful.

Dr. Whitman thought the operation absurd and extremely unscientific. No case of flat foot is cured until the important movement of abduction is perfectly free to its utmost limit. In the present instance, abduction is not possible, and the case is only relieved, not cured. The only way to cure flat foot is by increasing the power of the muscles which support the weak portion of the foot.

Dr. Halstead Myers said that as the pain in flat foot is largely due to periostitis about the attachments of the ligaments involved, and in the joint structures themselves, this operation with the Paquelin cautery might act beneficially by counter-irritation, just as it does in many cases of joint disease elsewhere. Relief from pressure during the healing of the wound, was also an important factor in the cure.

The President stated that if this procedure of Mr. Bond gave permanent relief from pain, that it would constitute a valuable accessory to our methods of relieving this troublesome symptom. In working people, in whom this deformity occurred most frequently, the question of a perfectly formed or perfectly acting foot was secondary. What patients wanted was first, relief from

pain, and secondly, feet that would give them an opportunity to earn a livelihood.

Dr. Phelps, in closing, said that the case was not presented as a cure for the deformity of *hallux valgus*, but that the flat feet seemed to be cured.

He had never observed periostitis in cases of flat foot, but he had frequently seen inflamed medio-tarsal joints, the result of pressure, and even the growth of new bone about the joints precisely as is seen in severe forms of lateral curvature.

The scaphoid bone is really the key-stone of the arch, and when it is dislocated downward by the lengthening of the tissues in the sole of the foot, it causes great pressure. The patient will experience pain. This pressure long continued, results in inflammation and growth of bone about the joint.

He thought it more scientific to shorten the girders of the sole of the foot than to do an osteotomy.

A CASE OF MULTIPLE JOINT DISEASE.

Dr. R. H. Sayre presented a little boy who had had a strange combination of diseased joints, without any rheumatic history.

When about two years old, the boy had a severe attack of scarlet fever, which was followed by an ischio-rectal abscess and a double otitis media, which still continues. About ten months after the attack of scarlet fever he fell, and shortly afterward the left knee became swollen and tender. A splint was applied, and the knee soon appeared well. Shortly after this, the right knee and the right hip-joint became successively inflamed. He was then treated for about a year by traction, first in bed and afterwards with a long traction hip splint. After this, the left knee, the right knee, and the left shoulder became successively inflamed, and so severe was the inflammation in the shoulder, that at one time it was almost completely ankylosed. In 1888, after an injury, the right knee and right hip became swollen and tender, and it was at this time, that the case first came under his observation. After the flexion had been overcome, a splint was applied, which produced traction on both the knee and hip-joint. Photographs were exhibited, showing the case with the splint applied. Last July it was considered safe to remove the splint. At present he has no pain; extension is good, and flexion can be made to a right angle. There is almost perfect motion at the hip-joint. He had looked upon the joint lesions as probably tubercular, but it was possible they were metastatic.

Dr. H. L. Taylor did not believe the joint lesions were tubercular.

The President also thought the whole clinical history pointed away from tubercular disease,

and that the scarlet fever had probably given rise to a rheumatoid condition.

Dr. A. M. Phelps said the trouble was either rheumatic or metastatic, and as the joints did not suppurate, the former was the more probable origin. While the application of the splint probably assisted in bringing the case to so favorable a termination, it was quite likely that constitutional treatment alone would have been sufficient. He had been misquoted with reference to the occurrence of flexion at the hip-joint. Where the *whole* number of cases have been reported, he believed the statistics would show that not five per cent. have recovered without angular deformity; yet he believed that not one single case of hip-joint disease need recover with angular deformity.

Dr. Sayre said that it was not material to this discussion whether the joints were tubercular or septic. The point he desired to bring out was that, no matter what the nature of a long-continued inflammation of a joint, protection of that joint is necessary. He agreed with Dr. Phelps that no case of hip joint disease ought to have angular deformity.

AN UNUSUALLY SEVERE CASE OF CONGENITAL LATERAL CURVATURE.

Dr. R. H. Sayre presented such a case. The patient is now fourteen years of age, but her mother says that at birth the deformity was nearly as great as now. It was one of the most severe congenital cases he had ever seen, and she first came to him one week ago. Examination at that time showed that between the lower and upper ribs was a large V-shaped gap, through which the liver could be felt. At the age of six years, she had pneumonia, and shortly after this, an abscess, which was probably connected with the pleura, opened through the right thoracic wall. Her breathing is puerile; there is no cardiac lesion. At the time of her birth, the child presented transversely, and the labor was difficult, so that it is possible that this may have had something to do with the deformity. He thought all the ribs were present. When first seen, her height was four feet six and three-quarters inches, but after being suspended, there was a gain of five-eighths of an inch. He desired to call particular attention to this increase in the height as the result of the suspension. In another case, between September 5 and October 15, there has been a gain of three-fourths of an inch; in another, there was also a gain during a month of treatment of three-fourths of an inch, and in still another, which measured before treatment four feet nine and seven-eighths inches, the measurement after about a month was five feet one and one-eighth inches.

Dr. H. W. Berg said that the mere fact that the patient had such excellent use of her limbs

would show that the curvature was not due to a lesion of the brain or spinal cord. If the ribs were congenitally absent, there would be sufficient cause for the curvature without supposing any injury during labor.

Dr. Judson remarked that the case was an illustration of the fact that in lateral curvature the kyphosis is sometimes very considerable, and may be as serious as in Pott's disease.

The President said that some years ago he had called attention to the frequency of lateral curvature in very young children, most of which he believed to be of congenital origin. He had repeatedly urged the necessity of the careful examination of infants' spines, as a matter of routine, and thus, were deformity present, an early opportunity for treatment. He believed that were this done, we should not see such distressing deformity as Dr. Sayre had presented. Quite recently, Dr. F. Beely, of Berlin, had pointed out that in these early cases of scoliosis, the bones of the head were not symmetrical. The case just presented was instructive as showing how great may be the deformity in cases which have not had the benefit of early and judicious treatment. Notwithstanding the deformity develops very slowly, so many cases apply for treatment with the deformity well marked that he was inclined to believe that a large proportion of all cases of scoliosis in children are congenital.

Dr. V. P. Gibney presented a case of hip disease showing

A REMARKABLE RECOVERY BY NATURE'S METHODS.

A boy of eight years was admitted to the hospital in 1882 with disease of right hip in second stage. Family history tuberculous. Disease dated back to the previous April. On admission he was fairly nourished, hip flexed to 100° , and held in this position. *Practical* shortening of three and three-quarters inches. On July 7, 1883, flexion had increased to 135° , and an abscess filled the whole gluteal region. On October 12 the abscess opened. November 16 he had become greatly emaciated, pale and waxy, the thigh acutely flexed on the abdomen and abducted, the head being apparently dislocated on the dorsum, while the whole thigh, from the junction of the lower and middle thirds to the trochanter major, was undermined, and large quantities of pus were discharging from two sinuses. Could only sleep with the aid of two drachms of the U. S. solution of morphia, and his condition was so bad that it was thought there was no chance of his recovery, and he was advised to be taken home. On the 27th of November he was visited by a member of the house staff, who found him suffering from diarrhoea and night sweats, with poor appetite, a pulse of

130 and a temperature of 101° . On the 7th of December his condition was about the same, except that a bed-sore, as large as a half dollar, had formed over the trochanter on the sound side. Not seen again until October 14 of the present year, when he returned, looking hale and hearty. He said that after leaving the hospital, he had been confined to bed for one year and a half, and had then begun to go about on crutches. For the past four years he had been wearing a five-inch high shoe. The site of the old abscesses and of the bed sores are marked by very large cicatrices; the angle of greatest extension is 100° , and that of greatest flexion, 90° ; the adductors are very tense. His measurements are as follows: R. A., $27\frac{1}{2}$; R. U., 30; R. T., 6 in. down, $13\frac{1}{2}$; R. K., 12; R. C., $10\frac{1}{4}$; L. A., 29; L. U., 36; L. T., 6 in. down, $17\frac{1}{4}$; L. K., 13; L. C., $11\frac{3}{4}$.

THE NECESSITY FOR EARLY MECHANICAL TREATMENT IN INFANTILE PARALYSIS.

Dr. W. R. Townsend read a paper with this title, calling attention to the various stages of the disease, the methods of making a prognosis as to return of power and as to deformities resulting, and demonstrating the value of mechanical treatment in all stages, but especially in that before the appearance of deformity as a method of prevention.

Dr. H. W. Berg called attention to the importance of avoiding heavy apparatus, which often seriously interferes with the paralyzed muscles. In addition to this, all such apparatus should be applied from a *healthy* fixed point of support. One of the most troublesome symptoms in long-standing cases of infantile paralysis is the low surface temperature. He had given relief in two recent cases by wrapping the limbs at night in cloths wrung out of ice-water, and covering these with warm bedclothes.

Dr. Whitman said that the author spoke of equinus and equino varus as the most common deformities in untreated cases. Equino-valgus he thought to be the most common deformity in treated cases, and it was very difficult to prevent.

Dr. Shaffer said that in the fourth stage, where contractures occur, and paralyzes are very pronounced, he had met with a very surprising series of cases. He had records of four cases of equinus in adolescents and adults, where the anterior tibial muscles and the quadriceps extensor femoris were involved, and the patient sought relief on account of the deformity of the feet. He had, by means of his antero posterior traction shoe, restored considerable power to these muscles. Another important point was the improvement in the nutrition of the feet resulting from this traction. One patient used to come periodically, as she expressed it, to "get her feet warm." Not only would the feet get warm

during the application of the traction, but they would remain so for the rest of the day. He had never seen such results follow the use of electricity and massage, and similar methods of treatment, with or without tenotomy. Of course, in calcaneus cases, this traction cannot be applied, and hence these desirable results cannot be obtained. The cause of the improvement seemed to be the peripheral nerve irritation occasioned by the traction, exerted principally upon the gastrocnemius and all the other resisting tissues. He had known the calf circumference to increase half an inch by actual measurement, during a month of this treatment.

Dr. R. H. Sayre thought that one explanation of the increased power of the quadriceps extensor could be found in the fact that the feet were placed in a position where they can be used more advantageously.

Dr. Judson considered the paper worthy of much attention, and it was a matter of congratulation that the profession at large already recognized the importance of sending these cases to orthopædic surgeons.

Dr. H. L. Taylor thought that we might go even further than the author, and state that a very large majority of the deformities of the lower extremities are preventable by proper orthopædic treatment. A very badly deformed foot from slight paralysis will often prevent the use of many muscles, and even where muscular power cannot be restored, proper mechanical treatment will often secure to the patient very respectable locomotion. Mechanical treatment, by enabling the patient to go around more naturally, will often increase the warmth of the limbs, but for very bad cases, he had for a long time made use of hot, dry air, or of two woollen stockings, one underneath, and the other over the brace, to keep up the proper temperature of the parts.

The President said that it was a popular idea that braces tend to bring on increased weakness of limbs, and various disorders, and until recently, the great obstacle to beginning mechanical treatment in the early stages, has been the opposition of parents and of the attending physician. Within the last year, he had seen two or three cases quite early, and had noticed a stage of tenderness, which might possibly prove a temporary contraindication to mechanical treatment. He did not think this condition had been mentioned very generally by orthopædic writers.

Dr. Whitman said that he had many times met with this condition.

Dr. Townsend, in closing the discussion, said that he thought much of the opposition to braces arose from the fact that orthopædic surgeons were not agreed among themselves as to what kind of apparatus was most suitable for the treatment of the different classes of cases. He desired to em-

phasize the importance of that part of the paper which refers to the experiments of Mr. Young on electrical examinations of muscles. If, by such an examination, one could ascertain that, in a given case, contractures and deformity would result, the task of persuading parents to allow their children to receive early orthopædic treatment would be a much easier one than now.

Medico-Legal Society of Chicago.

CHEMICAL CONSIDERATION IN POISONING.

Presented before the Medico-Legal Society of Chicago, Oct. 3, 1891.

By C. D. WESCOTT, M.D.

(Concluded from page 774.)

Arsenic is still an ingredient in the coloring matter of a great many articles which children constantly handle; it is used in the coloring of decorative paper and cardboard, in the coloring of children's toys, in crayons, in the coloring of candles which are used on Christmas trees; it is found in many patent medicines, in rat and mice poisons, all of which are left lying about in the most careless way, and it is truly wonderful that there are not more cases of poisoning.

Another point I would speak of, is in regard to the organs which should be selected from a dead body supposed to have died from arsenical poisoning to be sent to the chemist. Different investigators have not agreed as to which organs contain the greatest amount of arsenic, but it is well established that the stomach and its contents, a portion of the liver, the kidneys and a portion of the brain and spinal cord should be submitted in all cases where possible. A portion of the brain should always be obtained, as it contains the largest percentage of arsenic in many cases, though it is said by some investigators that the spinal cord contains the greatest relative quantity.

In regard to the antidote, I believe we should all have an old disused bag in which we could constantly keep a stomach tube, some of the more important antidotes and restoratives, that we could pick up and run with in an emergency. The most convenient substance from which the antidote for arsenic can be prepared is a solution of ferric chloride, two ounces to an ounce of ordinary sodium carbonate or washing soda; the latter can be quickly dissolved in warm water, and the solution of ferric chloride can be added, and we have a mixture which we need not strain or fuss with, but which can be given to the patient at once.

I have little to say in the way of discussion of the papers that have been read. Dr. Nelson referred to Fowler's solution as an antidote for snake poisoning. I think if I were bitten I should prefer to trust to the common antidote, whisky. Dr. Nelson suggested that the coma in arsenic

poisoning might be due to uremia. It occurred to me while he was speaking that possibly it was due to a direct action of the poison upon the brain substance, inasmuch as such relatively large quantities of arsenic are found in the brain post-mortem.

Dr. Moyer's case of Paris green poisoning is a puzzler, but it is no doubt a fact that Paris green is sparingly soluble, and is also a fact that stomachs and intestines differ very much as to their absorptive power and they differ very much as to their sensitiveness, and we would have to consider these facts in making up our minds in regard to this case. While death has been caused by the ingestion of one grain or less, of arsenious oxide, two ounces have been taken into the stomach, and recovery followed.

THE PATHOLOGICAL ANATOMY OF ACUTE ARSENICAL POISONING.

Read before the Chicago Medico-Legal Society, Oct. 3, 1891.

By DR. LUDWIG HEKTOEN, of Chicago.

In this communication only those anatomical changes that may be caused by acute arsenical intoxication, and are susceptible of demonstration in the fresh cadaver, will be considered.

While the frequency of poisoning with arsenic is steadily diminishing in certain European cities and countries, this mode of terminating life appears to be quite popular in this city. Of 431 cases of fatal poisoning investigated at the Medico-Legal Institute, Berlin, during the years 1876, 1877 and 1878, only eight were instances of arsenical intoxication; of 120 cases of suicide examined in Vienna during 1874 and 1875 only two had selected arsenic. In France, in 1857, arsenic was the poison employed in 35 out of 63 murders by poisoning; in 1860 it was used only 3 times in 32; in 1862, 5 times in 38.¹ Of 47 cases of acute poisoning admitted into the Cook County Hospital,² in Chicago, 1890, 8 were instances of arsenical poisoning. In 59 cases of poisoning investigated by the coroner of Cook County³ during the year 1890, 32 were due to arsenic; of the 59 cases 54 were suicides; 5 murders all due to arsenic; two of the murders to the mixture known as "rough on rats," 2 to arsenic in solution, 1 to Paris green. In 23 out of the 27 suicidal poisonings with arsenic "rough on rats" was used. One, and perhaps the principal reason, for this astounding frequency of arsenical poisoning here is undoubtedly the ease with which the poison is obtainable. Any child can be sent to a drug or grocery store for unlimited quantities of arsenic in the mixture called "rough on rats."

What destructive action arsenic in this form

may produce upon the red corpuscles, and the occurrence of thrombosis in the capillaries and larger vessels would certainly explain the hæmorrhages, some of the areas of necrosis and degeneration, as well as many of the clinical symptoms observed in cases of arsenical poisoning. This phase of arsenical poisoning will undoubtedly be subjected to future and fruitful investigation. It at once suggests itself that the microscopic demonstration of capillary thrombosis in a suitable case of supposed arsenical poisoning would go far to settle the question of ante- or post-mortem introduction of the poison in case doubt should arise on this point.

In order to bring before you the anatomical changes of acute arsenic poisoning I shall take the liberty to briefly describe the post-mortem appearances in two or three instances.

Case 1. Poisoning with "Rough on Rats."—This occurred in a family of four and was due to the sprinkling of "rough on rats" upon the corn eaten at the fatal supper. The father died about twelve hours after the poisoning, the mother, eighteen; in both the clinical symptoms were quite classical.

The post-mortem examination was made twenty-four hours after death. The appearances were quite similar in both, hence only one description is necessary at this time. The external appearances were absolutely negative except that the man's skin was yellowish; the facial expression was not indicative of any special emotion. The peritoneal cavity was empty, the peritoneum normal; the stomach was dilated in both instances, hanging low down; the subserous veins were moderately filled with blood; in each case the stomach contained about twenty-four ounces of turbid watery fluid of negative odor; the mucous membrane was rather pale, opaque and somewhat swollen, but in the cardiac and pyloric regions were punctiform and linear hæmorrhages and extensive areas of capillary hyperæmia. The commencement of the duodenum was quite uniformly red, the mucous membrane swollen; in the entire small intestine the valvular conniventes are voluminous; in the upper part are irregular areas, greyish white in color, surrounded by a red border; these areas are due to a false membrane, which can be peeled off, leaving a small area of necrosis with much capillary injection and hyperæmia. In the lower part of the ilium is much swelling of the solitary and of minute glands, but no croupous areas. The large intestine, as well as the small, contain fluid contents, greyish, turbid and full of shreds; the follicles are swollen in the upper part. The shreddy masses in the gastric and intestinal contents contain microscopically epithelial cells, round cells, mucous corpuscles and octahedral crystals of arsenic; in the rectum octahedra are found with ease.

¹ Casper-Liman, Handb. d. Gerichtlichen Medicin, 8 ed., 2 Vol., i, Berlin, 1889.

² Mitchell, Cook County Hospital Reports, Chicago, 1890.

³ Hertz, Report of Coroner of Cook County, Ill., 1891.

The mesenteric glands are larger than usual. They are soft, and pale-red on the cut surface. The pancreas and spleen are normal in both cases.

The kidneys are also apparently normal, except some capsular adhesions in the man. The liver is about normal in size; on the cut surface the lobules seem large, but the outlines are indistinct, the color yellowish. The heart is of normal size. In both cases there are subendocardial areas of blood extravasation in the left ventricle. The myocardium is pale yellowish-gray; it is comparatively flabby, and teased specimens show indistinct transverse striæ. The lungs are œdematous, pleuræ smooth and shining. The brain and the membranes are apparently normal. The pharynx, œsophagus and larynx upon chemical examination showed abundant arsenic in the gastric and intestinal contents, in the liver and in the kidneys of both the man and the woman.

To recapitulate: In these two cases solid arsenic, in the mixture known as Rough on Rats, produced, in twelve and eighteen hours, acute parenchymatous gastritis, acute croupous enteritis with hæmorrhages and capillary hyperæmia, acute follicular enteritis, swelling of the mesenteric glands, cloudy swelling of the liver and of the myocardium, and subendocardial ecchymoses.

Case 2. Arsenical Poisoning.—A wealthy family near Maplewood, in this city, was mysteriously poisoned with arsenic in the early summer of 1890, the father and a man-servant dying. This is the sensational Kuhn tragedy and mystery. The arsenic, probably in solution, was placed either in the coffee or in some pie, or in both, and in spite of appropriate treatment, the cases having been correctly diagnosed ante-mortem by Dr. T. J. Conley, the servant died in twelve hours, and the father in twenty-four. In both these cases, the changes differed considerably from the previous, hence a brief description of the autopsy of the servant will be permitted. It was made ten hours post-mortem. The body was well-nourished, muscular, about 35 years old. There were no external marks of violence. The peritoneal cavity was empty and the peritoneum normal. The stomach was somewhat dilated, and hanging low down, it contained 20 ozs. of grayish, granular fluid; the mucous membrane is very much swollen, covered with large flakes of viscid mucus; its tissue is the seat of innumerable hæmorrhages, occurring singly and in crops—these hæmorrhages occupy the summit of the folds as well as the depressions between them. The submucosa is swollen also, and distended with clear fluid. The contents of the duodenum are watery, its mucous and submucous coat are greatly swollen, and here and there are occasional hæmorrhages. The jejunum and ileum contain about 18 ozs. of faintly yellowish fluid, which looks like rice water. The swelling diminishes from above downward, while the

solitary and agminate follicles are considerably enlarged near the ileo-cæcal valve. The mucous membrane of the large intestine is pale, not much swollen, covered with strands of mucus; the contents rice-water like. The mesenteric glands are swollen. The liver shows indications of cloudy swelling. The kidneys seem normal. The respiratory organs and the upper parts of the intestinal tract are intact; the heart shows nothing abnormal, and the brain and its membranes show no structural changes.

Arsenic in abundant quantities was demonstrated by Prof. Haines in the gastro-intestinal contents, and in the liver and the kidneys.

To recapitulate: In this case the changes consisted of acute catarrh of the stomach and the small intestine, with œdema of the gastric and duodenal submucosa, hæmorrhages, follicular swelling, and a simple acute catarrh of the large intestine, with a commencing parenchymatous degeneration of the liver.

Case 3. Suicidal Paris Green Poisoning.—An old man swallowed a quantity of Paris green, and died in about ten hours. Autopsy in ten hours. Lips livid, skin over face pale, mouth and œsophagus normal, mucous membrane of pharynx swollen and quite red. The stomach is considerably dilated with gas, and fluid of a bluish or greenish tint; upon the inner surface are masses of mucus with green particles in it. The mucosa is greatly swollen and thrown into numerous folds, in it are numerous hæmorrhages, the free surface of which appears eroded. The contents of the small intestine show particles of green throughout the entire extent; the mucosa is much swollen, in some places opaque areas of varying size and form, with slight superficial loss of substance, can be observed; one of these areas is about 3 inches long, but does not include in all its parts the entire mucous membrane. In some parts there are fine hæmorrhages in the vicinity of these areas, and there is a general capillary hyperæmia. The solitary glands are markedly prominent, but the increase in the Peyer's patches is not so marked. In the cæcum the poison is macroscopically visible, but not any further into the large intestine, the mucous membrane of which is pale and free from corrosion. The liver measures $25 \times 18 \times 16 \times 6\frac{1}{2} \times 3\frac{1}{2}$. It is very flabby, the capsule is smooth, the parenchyma is brownish in color, with yellow spots, and the lobules are enlarged, with indistinct outlines and a congested centre. The kidneys are of about normal size, in the cortex are found numerous pin head size hæmorrhages. The mucous membrane of the ureters and of the bladder is swollen, and shows a few ecchymoses. The myocardium is opaque, yellowish-red, and underneath the endocardium of the left ventricle are many extravasations. The lungs and pleuræ are quite normal, ditto brain.

Recapitulation.—Acute gastro-intestinal catarrh with hæmorrhage, erosions and capillary hyperæmia; acute parenchymatous nephritis with swelling of and extravasation into urethral and vesical mucous membranes; acute parenchymatous myocarditis, subendocardial extravasation.

If we now pass in brief review the various changes that may be produced by arsenic it will at once become very evident that they are exceedingly fitful and freakish, subject to marked variation in intensity and extent, not bearing a constant relation to the quantity introduced nor the time elapsing between the ingestion and the fatal end, so that a general description of all the changes that may be produced would rarely apply to a single concrete case.

Commencing with the mouth and the upper part of the digestive tract, it may be said as a general rule that arsenic does not produce any changes upon the mucous membrane of the pharynx and œsophagus, when taken in its usual form, although Woodman and Tidy⁴ state that congestion of the gullet, mouth and windpipe from the application of the poison during vomiting, is general. Externally the stomach and intestines do not usually present any changes, although it is usual to find the stomach somewhat dilated with gas and fluid, but the serous surface is almost always smooth and shining while the amount of blood in the subserous veins may vary within wide limits; the authors just quoted state that inflammation of the peritoneum is occasionally found, but except in very rare cases where it is secondary to perforation of the stomach, this does not seem to have been described by other reliable observers. The contents of the stomach are usually a little bloody with considerable adherent viscid mucus; the mucous membrane is usually swollen, in some places it may be markedly opaque and greyish yellow in color. The epithelial cells under the microscope showing typical parenchymatous degeneration; at times it may be the seat of areas of capillary injection and hæmorrhages, especially in the cardiac and pyloric regions, and small areas of necrosis can be observed on the surface of the hæmorrhagic districts; then there may be croupous areas, that is, places covered with a more or less easily removable greyish membrane, which microscopically shows a fibrinous network entangling mucous corpuscles, epithelial and round cells and, often, octahedral crystals of arsenic; the submucosa may be doubly thickened from œdema; perforation and gangrene are very rare occurrences, but cases are stated to be on record. Similar processes may continue into the duodenum and a considerable distance into the small intestine; usually the contents of the small intestine are rice-water like; the mucous membrane may show catarrhal enteritis, areas of croupous inflammation together

with hæmorrhages, districts of capillary hyperæmia and areas of necrosis and erosion; the follicles, solitary and agminate glands may be and very frequently are enlarged either from œdema or from cell multiplication. The mucous membrane of the large intestine is also often the seat of a catarrhal or follicular enteritis with swelling of the mucosa, and the production of viscid mucus; octahedrals may be found microscopically, and Woodman and Tidy state that the rectum is invariably the seat of an acute inflammation, a statement that seems to me to be too sweeping.

Simple hyperæmia of the intestinal and gastric mucous membrane is exactly similar in appearance, whether it owes its existence to physiological or to pathological conditions. The differentiation will depend upon the nature of the secretion and upon the appearance of the interstitial tissue and the lymphatic apparatus. Acute gastric catarrh is always accompanied with the production of a viscid, glairy, clear mucus; acute intestinal catarrh results in the outpouring of a considerable amount of watery fluid; an acute catarrh of the large intestine, on the other hand, again leads to the production of viscid mucus. If a few hours pass between the commencement of the inflammation and death, and especially if the irritant be of some intensity, it nearly always leads to inflammatory œdema of the mucosa and submucosa, and to considerable increase in the size of the regional lymphatic glands.

The hæmorrhages and the hæmorrhagic erosions will be more marked in cases of severe and prolonged vomiting, and in cases of poisoning with arsenic in a solid form. The hæmorrhagic necrosis is probably in part due to the production of capillary thrombosis, as shown by Silbermann;⁵ from its point of arrest in the stomach or intestine, arsenic is absorbed into the capillaries and lymphatics; here it causes thrombosis, and a consecutive hæmorrhagic necrosis may follow, the tissue succumbing completely to the action of the gastric juice and to the attack of intestinal microbes. The croupous exudate seems to be formed only when solid arsenic has been taken; Lesser⁶ states expressly that he has never observed it except in such instances, but not invariably even then; this is a point of some practical importance.

The mesenteric glands are usually swollen, red and soft, partaking of the general regional lymphatic enlargement.

Cloudy swelling and fatty degeneration are found frequently in the liver, though Woodman and Tidy⁷ state that no post-mortem appearances are found in this organ, but Lesser⁸ and Caspar⁸ have observed such changes in eighteen, in nine

⁵ Virchow's Archiv., Band. 117.

⁶ Atlas der Gerichtlichen Medicin, Berlin, 1888.

⁷ Loc. Cit.

⁸ Text-Book of Path. Anatomy and Pathogenesis, New York, 1887.

and in seven hours, the liver being flabby, increased, perhaps, in size, the parenchyma being opaque and brownish, with yellow areas, enlarged lobules with indistinct outlines, congested centers, and pale, cortical zones; microscopically, the cells are large and granular, with indistinct nuclei; acetic acid may dissolve some of the granules, and boiling alcohol and ether others. According to Ziegler, various poisons, such as phosphorus, arsenic and the ferments which produce fever, may, like imperfect oxygenation, lead to disintegration of the albumen of the tissues, and so to fatty degeneration.

The kidneys may show no changes at all, or they may be seat of parenchymatous degeneration and small cortical hæmorrhages, the urinary sediment corresponding exactly to that in acute nephritis generally; the ureteral and vesical mucous membranes may also be swollen, and show hæmorrhagic extravasations in occasional instances.

The heart is often the seat of a parenchymatous myocarditis, especially of the muscles of the left ventricle, which are soft and flabby in consistence, grayish-yellow in color on the cut surface, and under the endocardium of the papillary muscles, the microscope showing typical cloudy swelling in the muscle fibres. Underneath the endocardium, especially if not exclusively of the left ventricle, are very frequently found small, irregular shaped, but typical areas of hæmorrhagic extravasation similar to those observed in cases of asphyxia.

Any changes in the lungs directly referable to the action of arsenic cannot be said to occur, except that subpleural hæmorrhages are found quite often. The brain and spinal cord and their membranes are usually negative on microscopic examination, although the arsenic accumulates there in greater quantities than in the other tissues of the body. Arsenic produces well-marked changes in the nerves, the further consideration of which does not belong here. The blood is stated to be dark in color, and to coagulate feebly, and imperfectly collecting in the heart and the large veins, no thick, firm and solid clot being formed. In connection with this, it is interesting to note the experiments of Silbermann,⁹ who, by means of injections of various poisonous substances, and among them, arsenic, into animals, came to the conclusion that many of the clinical phenomena and anatomical changes in arsenical intoxication are directly referable to the power of arsenic to cause a vascular dyscrasia resulting in primary capillary thrombosis, with the formation of secondary stagnation thrombi; he observed the formation of capillary thrombi and antochtonous thrombi in smaller vessels, especially veins, and even in the heart, in animals which were injected with arsenical

solutions and vivisected during the violent symptoms of poisoning that soon followed, arsenic acting as a typical blood poison.

THE LEGAL ASPECTS OF ARSENICAL POISONING.

Presented before the Medico-Legal Society of Chicago, Oct. 3, 1891.

By the HON. C. G. NEELY, (Assistant States Attorney.)

The papers which have preceded what I wish to say have dealt with the question of arsenical poisoning from its medical manifestations, and with scientific truth, not theory but fact. After listening to the papers and remarks made here this evening it is not strange to me that it is so difficult to prove murder by arsenical poisoning.

In viewing arsenical poisoning from a legal standpoint you will have to understand one or two things: Every crime on our statute books is characterized by certain essential and necessary elements, which, as a matter of course, must be proved and which generally are capable of proof; not that proof can always be made, but proof is possible. For instance, you take a case where the charge is larceny, we speak of it as larceny as lawyers, it is simply stealing, and the gist of the larceny or stealing is to be taken as contradistinguished from accident, mistake or the like. The gist of burglary is the entering into any building with force or without force, with the intent to commit a felony or larceny. The gist of murder is malice, the unlawful killing of a human being with malice aforethought.

So you can see from these illustrations that what a prosecutor must do is to prove what he charges. You gentlemen of the medical profession dealing in scientific truths as you are, are not content with theory at all. In that respect the legal profession meets you and greets you. It is one thing to charge an offense and it is another and entirely different thing to prove it, I do not care whether it is a charge made in the form of an indictment in a criminal proceeding, or whether it is a libel on the street or anywhere else. The older men grow the more they learn; it is one thing to assert and another thing to prove. Truth and evidence get mixed. I presume that lawyers and courts have as much trouble in making the laity, if I may so term the uninitiated, understand the difference between evidence and proof as physicians do with having the people among whom they practice understand the difference between a genuine and thoroughly educated medical man and an advertising quack.

Evidence is that which tends to prove a thing, a means by which proof is established, and proof is the natural, logical result of evidence. And oftentimes lawyers are annoyed, particularly those of the prosecution, by people saying, "Why, this was proved." It was not! It was attempt-

ed to be proven and failed, but they did not know the difference. When a prosecutor begins a case where there is a charge made that death has been occasioned by poisoning, or an attempt had been made to occasion death by poisoning, he is put very much in the same position as a physician or surgeon when called to the operating table or sick room. The first thing the physician has to do is to diagnose the disease, in other words find out what is the matter. The physician calls it diagnosis, the family asks, what's the matter, they mean the same thing. The lawyer when he commences a prosecution on a charge of arsenical poisoning, or death by any poisoning, must at once determine what means he shall use to get at the truth. Now it is easy ordinarily, when a crime is charged, to find some circumstance connected with the perpetration of the offense that at least indicates where the truth lies. But when you take a case of arsenical poisoning the very statement of the charge indicates the manner of the procedure; the plain English of it is, this man was killed by being poisoned with arsenic, prove it. How are you going to begin to prove it? You have heard tonight what these gentlemen have said who understand medicine and the treatment of disease. I cannot speak on that question at all, but when you begin to cast about for a line of procedure in the prosecution of a case of that sort, the first thing to be done is to prove that the person is dead and was killed by poison. If the indictment charges arsenical poisoning and you prove any poison, that is sufficient. If death was caused by poisoning, the question arises, what poison? Suppose you suspect arsenic, you can see the legal profession is at once thrown right into the hands and arms of the medical fraternity. The whole proof in a poisoning case rests on the medical profession. It is not enough to say that a man is dead, that he did not die of natural disease, that there was no violence used upon him. It is not enough to say that some person had motive enough to kill him, or that some person threatened to kill him, nothing will suffice except to prove that he was poisoned, and that beyond a reasonable doubt. Not by mere preponderance of the evidence, not by mere suspicion, but what was actually the fact beyond a reasonable doubt. The first question then is, was the drug used a poison, a noxious drug? Who can tell that? Lawyers can't tell it, the ordinary witness cannot tell it. If it is a burglary case any witness can tell what was done; it does not take expert testimony to prove that a revolver is a deadly weapon, but in this sort of case the first thing is, was this drug a deadly poison, and it requires an expert to prove it, some one who understands the drug. In beginning his examination the physician stands very close to the lawyer. He looks into the stomach, liver, kid-

neys for poison and he finds it. Without taking more time he is satisfied that this poison is arsenic or some noxious drug, then the question arises immediately, how was it administered. A man shoots another and people can say, he shot him, he stood up and shot him, said he was going to shoot him. This is easy. But how was that poison given, who administered it, is the great question for proof from a legal standpoint, in a case of poisoning. There comes the expert again, the physician or the chemist, and when he begins to determine how it was administered he calculates first on the amount given, whether or not it was an overdose imprudently taken by the person himself, or whether it was an accumulation of proper doses given at regular intervals, having massed together and occasioned death. The traces left in the organ itself usually throw some light on the subject, and in those cases where death is instantaneous, as from prussic acid, the position of the body throws great light on the question as to whether it was self-administered or not. The first question is, was there poison enough to kill, then did the man take it to kill himself or was it administered by somebody else. Suppose the quantity negatives the thought that it was self-administered, then the question is, who did administer it? The ordinary laws of proof come in there. Suppose it is admitted by the defense that he did administer it, but in the proper way and for proper purposes. Suppose it is claimed that it was given accidentally by a person unacquainted with the drug. Suppose it is contended that it was given by a physician acquainted with the drug, or by some one else who understood the drug, but by mistake too large a quantity was given. If it is admitted that the defendant, or accused person gave it, but he claims that he did it properly under medical advice and direction, then is it proper to show that he has poisoned other people. Any legal writer would say that it is never proper to establish any other offense than the one which is being tried. But when the idea is advanced that the poison has been given accidentally, or with good purpose by mistake, it is proper to introduce evidence of other poisonings to rebut the theory of accident, it not being possible that a man should poison one case after another from accident.

It is a singular fact, hinted at in some of the papers to-night, that poisonings do not occur singly, but they are nearly always in a series. A man poisoning his wife began by poisoning his first wife and his child. In the Newland case first the father was taken, then the mother and the children. A person giving a drug which we do not know the nature of, with proper medical advice, from good motives, without wicked intent, would be guilty of manslaughter for carelessness.

After these primary conditions are out of the

way and it is decided that the accused gave the poison, the question arises, how are you going to prove that he gave it? Did he have the article, or did he manufacture it. You look at the materials out of which the poison is compounded. If it is a fact that he has manufactured the drug, it is competent for the prosecution to show that he did and had the vessels for compounding it in his possession. It is competent for him to show that he had them in the line of his business, and that it was nothing unusual for him to make poisons. Another question which arises is this: It is not enough to prove that the man is dead, and that poison was given, but it must be shown that the poison found in the body was put there before death or before the body was exhumed. In a large number of cases the body is buried and suspicion averted. Then, as Dr. Hektoen said, the crime is often buried by the undertaker who has used embalming fluid in the body. If the body is exhumed and examined, then the question comes up, has it been tampered with by strangers. I cite this outline briefly so that you can see how difficult it is to prove beyond a reasonable doubt that a man was poisoned wickedly and maliciously. Now passing to malice, how are you going to prove it? You have got to the point where the medical expert testimony is that the man was poisoned, the drug had been detected, its character is known and the indications are that it was a case of poisoning, not suicide, and that the accused did it, that is proven. You are only about one third started; now the question is, why did he do it? Suppose you show that he did not do it from any good motives, but negative intention does not prove anything. Suppose the prosecution proves that it was done maliciously. Suppose it is the case that the accused went out of his way to be in the company of the deceased, insisted in preparing food for him but abstained from eating or drinking any of that food. I believe it is a fact that in a case of this sort the legal profession always welcomes the testimony of the expert. I suppose it is a fact that when a man dies and you discover arsenic in large quantities even in the body, the best that can be said is that the strong possibilities are that arsenic caused death, but no man actually knows whether he died from the poison so introduced or whether he died from disease, unless it is a very marked case.

On the question of malice, if it is proved that the person accused administered the poison, that he knew it was a deadly poison; if he disclaims the knowledge and it is shown that he did it, then the inference of guilty knowledge or malicious intent is strong indeed. I presented the Newland case to the jury that tried Mamie Starr for murder. In the presentation of the case the fact that the father, Mr. Newland, died, came out fully, but in that case there were not the usual

difficulties occurring. I ought to say in passing that one of the proofs of wholesale malice, one of the proofs of intent that negatives and rebuts the idea of accident, is that the poison employed is one not ordinarily in family use. Not such a medicine as might be easily mistaken, not something that might be given in too large a dose with no intention to harm, but they nearly always employ some medicine that is used for the purpose of attacking life. In the case of the Newlands this girl had gone to the family and staid there through the day. She was kindly treated and had no occasion to find fault; she had no ill will against the family and apparently no motive. I want to suggest that motive and intent are separate and distinct. Motive is that which moves the person to do the thing and leads him to make up his intention. Intent is the purpose for which he does it. So while we do not have to prove motive, it is always of great assistance; but in that case there was apparently no motive. It was proven that arsenic was used, because the girl asked for 25 cents just before supper and went to the drug store to get some toothache medicine. At the drug store she asked for rough on rats, and asked the druggist if he had anything else that would kill rats. He said he had, but that rough on rats was more poisonous and would kill them quicker. She bought a box of rough on rats and some chewing gum, paying 15 cents for them. She asked if she should get supper and opened a can of corn, and, as she herself said, took a pinch out of this box of rough on rats and put it in the corn. She did not taste the corn. The testimony was that they complained of a burning sensation in the roof of the mouth, and thirst, and they began leaving the table, and the mother was up stairs vomiting within 15 minutes of the time she sat down to the table. When the family began to be sick, first the mother, then the father, then the son and the daughter, all that composed the family, this girl was found in a crouching position in the hall, and when the daughter went out and said to her, "Mamie, what did you put in the corn; did you put pepper in it?" she appeared to be terror-stricken, and denied having put anything in it. She disappeared, and when the doctor came and looked around for arsenical poison, the girl could not be found. She testified that she took the box of rough on rats, put it in her apron and threw it away. She said she put it in the corn for the purpose of seeing what the effect would be.

I speak of that case because you can see from the statement what the legal aspects of a case of poisoning are, whether it is arsenical poisoning or any other. I want to say that we are glad to see physicians come into court because their testimony is generally concise and to the point, it is direct and positive, and is not the ordinary

rambling indifferent statement of witnesses which by its very carelessness is confusing. Physicians are known to stand for the amelioration of suffering, and the saving of human life. There probably is no profession known among men where its members stand so close to the home circle as does the physician, the ministry not excepted. The physician stands in the home at birth, in sickness, and in death. The place where the physician as a professional man meets the lawyer on the highest grounds of scientific truth is in a court of justice, where the question is, was the death of the deceased occasioned by poisoning, and if so, what shall be done in order that the crime may be punished and justice done? and it is about the only time and place I know of where a physician is called upon to make a statement or do anything against human life and liberty, and he does it then in the interest of justice.

I thank you, Mr. President and members of the Society, for the honor you have done me in asking me to speak to you and for the attention with which you have listened to my remarks, and I assure you that the work of the physician and lawyer in our courts of justice on the higher grounds of scientific truth is a work that is welcomed by both professions alike.

Discussion of Papers.

Dr. L. H. Metler: I would like to suggest for the consideration of the chemists present, a very shrewd suggestion of Mott, of New York. This question was discussed before the Medico-Legal Society of that city, and he stated that oftentimes the presence of the poison is proved, but the question is, Did the patient die of the poison? Prof. Mott suggested to the chemists that if they could find the chemical or physiological combination between the living protoplasm and the arsenic, it would be a grand discovery, and would throw great light on these cases where there is difficulty in deciding whether the patient died of arsenical poisoning, or whether the arsenic was thrown into the body after death. If such a combination could be found, if the poison were taken during life, some part of the body would show the combination, and would go a great way towards solving the difficulty. I was much interested in Prof. Mott's suggestion, and presented a paper to that Society, in which I showed that if even such a suggestion were carried out, it would be uncertain, because physiology tells us that we do not know just when death occurs in the whole body. Rigor mortis is supposed to be similar to muscular contractions by many leading physiologists, and if that be true, if the arsenic is used in an embalming fluid thrown into the body, there will be a possibility of the combination of protoplasm with the arsenic.

Dr. F. Formanack: I have listened to the discussion of these papers with a great deal of interest. During the last four years I have had about five cases of arsenical poisoning by Paris green, one of which died. In regard to the embalming fluid, I would say that I was called to a case by an undertaker a few days ago, where a man was supposed to have died from taking Paris green. He was insured, and the policy was such that if he had committed suicide the insurance would not be paid, so I was requested by the relatives to make an autopsy. It seems that the coroner had made a post-mortem, and the jury had given a verdict of suicide by taking Paris green. When I got there I found that the undertaker had used this arsenical fluid, so of course it was of no use to make even a chemical examination of the organs. This was a medico legal case where the embalming fluid should not have been used.

Dr. J. J. M. Angear: I remember distinctly that Prof. Blaney, in a lecture upon arsenic, stated that we had better not administer an emetic, or at least not until we had put large quantities of milk and eggs, or something else, into the stomach, to gather up the material, and if the emetic were administered then, we would be likely to get out all the arsenic. Some such fact has come out incidentally this evening, but I would like to bring it out more pointedly. While Prof. Blaney was lecturing on arsenic and using it in solution on his table, by mistake he took up the wrong tumbler and drank it off. He discovered that he had swallowed the arsenical preparation, and asked one of the boys in the class to get him some eggs. He cracked three or four and swallowed them, then went on with his lecture, and as soon as it was over, he went into the laboratory and took an emetic. I carried out that suggestion some time ago. I was called to a woman who had taken arsenic for suicidal purposes. Vomiting had commenced, and I ordered all the milk she could drink. She would swallow a cup of milk and it would come right up; this was done repeatedly, and the result was favorable.

Another point has been hinted at to-night, but not brought out as prominently as I would like to have it—that is, the care with which the material from the body is preserved. I know of one case in the rural districts, where a post mortem was had and the contents of the stomach thrown away, and the stomach put into an old tin can and sent off to be tested. I have known a number of cases where it would have been utterly impossible for an attorney, or a medical man or a chemist, to go before a jury and state positively that there had been no opportunity whatever for a vicious person to put arsenic into the material, and as a matter of course that would vitiate the whole proof.

Dr. H. T. Tillotson: The question of embalming fluid which has been brought up to-night reminds me of a case I had a year ago. A young lady at a party partook of cake, and some time during the night she began vomiting, and had colicky pains, with other symptoms of poisoning, and in about thirty hours she died. I took it upon myself to look after the cake question, and while I was out the undertaker was called in, and embalmed the body. I called him up by telephone to ascertain why he did it so soon, and his excuse was that he was asked by the family to do so. I wanted to know why he did not wait for the death certificate, and he said he never had and never would wait for a death certificate. I inquired of other undertakers, and they claimed the same thing, they will embalm the body as soon as the friends ask them to do so, and will not wait for a death certificate.

Dr. A. W. Baer: About a year ago I was called to see a young man who had taken poison, and as I was called in a great hurry, I neglected to take a stomach pump. I asked for hot water and mustard, but they did not have any, and I sent to a saloon for some mustard. The young man, in the meantime, laid in a comatose condition. I mixed the water and mustard, and attempted to get it down him, but was unable to do so, and thought I had a corpse on my hands. I asked one of the men present to get it down if he could, and I reached for my hypodermic needle, which had some nitroglycerine in it. Without taking very much care, I inserted the needle in the muscles underneath the arm, and the man jerked the arm away from the needle himself, and it took four men to hold him on the bed, to keep him from getting up and killing the doctor. I then succeeded in getting the mustard down. He acknowledged that he took a white powder, which I thought was arsenic, but it was the effect of the nitroglycerine on the comatose condition I wished to call attention to. I think the condition was due to arsenic, and not to morphine, for it was an hour after he had taken the drug, and if he had taken the dose he did of morphine, it would have had a different effect on him.

Dr. Daniel T. Nelson, in closing the discussion, said: I will only speak of one or two points. Dr. Hektoen spoke, I think, truthfully of the contents of the stomach and intestines looking like rice-water discharges, which are familiar to all physicians in cholera, and the appearance of the patient, it seems to me, is so much like cholera as to suggest the question propounded by Dr. Vescott as to whether the arsenic does not affect profoundly the nervous system, as the cholera poison does. I am inclined to believe with Dr. Vescott that, primarily, the coma and convulsions are due to the direct effect of the poison upon the nerve centers of the brain and spinal

cord, and hence the paralysis in chronic cases; but possibly, subsequently, before death, there may be convulsions of a uremic character.

In the autopsies described by Dr. Hektoen, one point seemed to me especially characteristic and interesting. The thirst and dryness of the throat and fauces before death have been noted by all; and yet, after death, there is little to be seen of pathological change there, and I believe this is true also in cholera.

One suggestion as to an antidote. Dyalized iron is perhaps as efficient as the wet hydrate of sesquioxide; it is certainly very convenient, and can usually be found in the drug stores; can be used without preparation, and can be given in any dose safely.

The following resolutions were unanimously adopted:

WHEREAS, The science of Forensic medicine at the present time demands such exactness and thoroughness in the post-mortem examinations of medico-legal cases as to always require greater facilities than those presented in a private dwelling or common undertaking establishment; therefore, be it

Resolved, By the Medico-Legal Society of Chicago, that the coroner of Cook County be urged to send all bodies requiring a post-mortem examination to the new county morgue, and that such facilities as the importance of the work demands be arranged for in the morgue building, so as to make it as complete a medico-legal institution as possible under the circumstances. And further:

WHEREAS, There are no restrictions upon the sale of arsenic, which often facilitates the commission of crime; and

WHEREAS, The use of embalming fluid containing arsenic by undertakers obscures cases of poisoning by this drug, is not necessary, and causes the miscarriage of justice, it is

Resolved, That the sale of arsenic should be strictly regulated by law, and the use of arsenical embalming fluids should be entirely prohibited.

ARCHIBALD CHURCH, M.D.,
Secretary.

DOMESTIC CORRESPONDENCE.

HOT SPRINGS, ARK., Nov. 10, 1891.

Editor The Journal, Chicago, Ill.:

Desirous of calling the attention of the medical profession to the anomalous condition of things existing at this place, I ask the publication in *THE JOURNAL* of such facts as are given herewith:

This town is sustained *entirely* by visitors coming here in search of health or pleasure, mostly the former. There is literally nothing else. The facility with which the invalid can be gulled on his arrival here is startlingly wonderful, and opens a very fine field for sharpers, who are nominally in the profession, aided by ropers who meet the victims on the railroad trains and beguile them first to a boarding house and bath house, and finally to the doctor's office to be robbed and maltreated.

This evil has assumed such outrageous proportions, that the few practitioners here who take the code for

their guide, are compelled in self-defense to cast about for some method by which they may hope for success in at least mitigating the evil, if not abating the nuisance entirely, both in the interests of humanity and their own.

The condition is "*sui generis*." There is no other place like this. And if we keep within the letter and spirit of the code, we see ourselves daily robbed, to be at last driven out of the field to give place to *other unfortunate ethical men* tempted by the apparently fine prospect, or to be succeeded by the vampires who are already so numerous here. We succeeded in getting passed, by the last Legislature, a law providing for the revocation of license for certain offenses, among which are the subsidizing hotels, and the employment of drummers. The constitutionality of this law is still to be tested; but if it stands, it is very difficult to get cases properly proved up before the medical board which has the jurisdiction, because of the fact that the witnesses—invalid visitors—who are generally desirous of avoiding the notoriety and detention consequent on a summons to court, to say nothing of the possible delay involved—generally prefer to pocket their wrath and lose their money rather than expose themselves to further vexation and the threats of these ropers, who hesitate at nothing.

At one time we circulated a poster on the incoming trains, at considerable expense, but without success, for reasons which would occupy too much space to detail, but which will be given in future if desired.

We cannot fight these men through the press without laying ourselves liable to the charge of advertising ourselves, and we don't know what to do.

Is it possible to put these matters before the profession, with the view and purpose of eliciting discussion? and perhaps some legislation at the next meeting of the American Medical Association, which would allow us to show through the press, or a paper of our own, the actually existing condition, thereby not only sustaining legitimate medicine, but keeping large numbers of invalids out of the hands of irresponsible men.

Did it not occupy too much space, I might add to the foregoing the fact that we have here an organized and recognized medical society; that there are quite a number of doctors here who have heretofore put themselves outside the pale, but who have quit the objectionable methods and desire to be recognized, and as to whom there exists some difference of opinion among members of the Society, arising from the very peculiar condition here (as I said *sui generis*); that the irregulars largely outnumber the regulars, being at present *about* as 16 or 18 to 35 or 45, the figures constantly changing.

A very amusing and interesting article might be written by one disposed to give facts as to the *methods* of these bunko men, and one which would also contain much pathos.

To day I met a man who failed to get a license from the local board, inquiring about an office. As I suppose, he has been to some of the "back counties," where he found an examining board less uncompromising. If I'm correct, this shows the inadequacy of existing law to protect the people and the profession.

Very respectfully, JOHN H. GAINES, M.D.

Case of Supernumerary Mamma.

To the Editor:—The subject of this article is one of some interest; and especially so in this particular case, on account of the size, and as well as the fact, that this mamma, or milk tumor, did not develop until the fifth gestation; and there was no sign of it before that time, so the patient states.

We find quite a number of cases of supernumerary mammae on record, but none with a history like this so far as I know. Bruce has examined 4,000 persons and finds the deformity to be 1.54 per cent., and he says the axillary prolongations are not infrequent and may be mistaken for lymphatic glands; also states the left side is the most common locality of these deformities.

Evy Williams, col., age 39. Married; had six children. Health good. Three years ago, she was delivered of a child and at that time noticed a lump under the left armpit, which was soft, movable, and not painful or tender on pressure or sore, as she states.



One month after her delivery she noticed this lump was increasing in size, and it reached the size of a hen's egg, and remained so for two years, which was the length of time she nursed the child. After this it seemed to disappear until her next delivery, or three weeks before her confinement, it was about the size of a hen's egg, and continued to grow and was somewhat painful.

The child is now two months old, and you can see in this photo. the size of this extra mamma. You can also see it has no nipple and there is no discharge of milk; but it is somewhat soft and full of milk. I have compared the secretion from this tumor to the milk from the breasts and it is identical, the fat globules are easily made out with microscope. I have made two examinations of this under the microscope.

L. G. HARDMAN.

Harmony Grove, Ga., Nov. 9, 1891.

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SATURDAY, NOVEMBER 21, 1891.

ETIOLOGY.

In determining the etiology of a disease, it is particularly important that all the causative factors should be considered. It is not sufficient to assign to one factor an overweening importance, and call it the cause. Let it be admitted that tuberculosis cannot exist without the bacillus tuberculosis, nevertheless, it is only one factor in the etiology of this disease. If this latter statement were not true, this omnipresent bacillus would soon play sad havoc with the human race. These statements are trite, but we submit that the truth which they embody is frequently overlooked, in this age of bacteriological activity. In the investigation of the etiology of a specific disease, it is much easier to determine with accuracy the particular microorganism which may be concerned in its production, than to determine the other factors involved. There is something brilliant about discovering and naming a bacillus; it is accurate and therefore pleasing to the mind, and it is not surprising that a relatively greater importance is accorded to this factor, than to those which are less well established. However, it must be admitted that comprehensiveness here is necessary; nothing less can be admitted as satisfying scientific accuracy. If the natural history of a microorganism could be so thoroughly studied that all the factors favoring its development

should be known, and all the factors retarding its development should likewise be known, and means existed whereby the presence or absence of these factors in the human body could with certainty be determined, then, theoretically at least, the complete etiology of the disease determined by this microorganism would be known. But this ideal solution of the problem is far in the future; if, indeed, it ever be realized.

For the present, at least, we must be content with the light which can be thrown on the subject by the clinic, and it is surprising as well as gratifying, to see how well clinicians have done their work, and much information, often of a curious nature, has been obtained from this source.

The germ of scarlatina has as yet escaped the researches of the bacteriologists, but whatever may hereafter be shown to be the size and shape of this germ, whatever be its reactions with stains, or its peculiarities of growth, or its action upon various food-stuffs, clinicians know that it has a strong hold on life, and finds a favorable nidus in clothing, furniture, toys, and wall-paper, and many other things. They also know that it has a peculiar predilection for early life—so much so that nearly half the cases are found between 1 and 4 years of age. Long before the discovery of the KOCH-EBERTH bacillus, clinicians knew that the stools of typhoid patients contained the poison of the disease, and that drinking-water contaminated with these stools was the most common means of transmitting the disease. And this information is much more valuable to-day than any which has been furnished by the more exact knowledge of the bacillus, particularly since the means of recognizing the germ have been called in question.

It is useless to multiply instances showing the remarkable accuracy and wide extent of the additions to etiology which clinical research has made. The field for clinical work in etiology has by no means been exhausted. Much remains to be done. The method, however, is a slow one, as opportunities must be waited for, and when they come their significance must be at once recognized, or the chance is lost. This is very different from laboratory work, where a definite series of experiments is planned, at once carried out, and the results used to modify the conditions of subsequent experiments. Such

work as this is to a large extent mechanical, and we are sorry to say that many of its advocates, dazzled by the rapid acquisition of knowledge by its methods, have put themselves in a position of assumed superiority, and regard the clinician with mingled pity and contempt. It should never be forgotten, however, that all laboratory results must ultimately be tried for their sufficiency and comprehensiveness, by the clinical test.

Certain of the work in etiology which can best be done by the clinician, is work which can only be done in small communities. To trace the origin of a case of infectious disease with certainty, it must be possible to trace it to a single source, and to exclude positively all other possible sources. Such conditions are never found in large cities, but occasionally may be met in small communities, and it is the opportunity as well as the duty of the medical men who live in small communities, to watch for these cases, observe closely, trace carefully, and report for the benefit of the profession. From the nature of the subject, while a single report is valuable, a multitude of such reports, whether from the same or different sources, has a much greater value, and no one should hesitate to assist in the multiplication of such facts. In a hamlet of two or three hundred people, it is possible to know exactly whether an infectious disease exists or not. When the first case of infectious disease breaks out in such a community, it is usually easy to find the particular individual who has been the means of transmitting the poison. Then should be noted all the circumstances concerning such transmission. Over how great a distance was the poison conveyed; how did the transmitter of the disease travel; was travel for miles in an open wagon insufficient to dissipate the poison; how long was the individual exposed to the first case, and in what sort of contact with him was the one who subsequently developed the disease; what was the stage of the disease when the carrier got the poison from it. This last item is of particular importance. To this day it is not known with certainty whether or not scarlet fever can be transmitted from a patient in its very earliest stages, and yet every physician wishes sincerely that he knew.

It is not our object to review with any completeness the etiological factors which may be established by clinical observation, but rather to plead for the recognition of a broader and more

comprehensive etiology than is the custom to-day; to emphasize the value and importance of clinical research in solving the problems of etiology; to show that some of these problems can only be solved by the medical men in small communities; and to enlist the services of men so situated in making observations of this character. We shall be pleased to publish any communications from our readers on this line of work, which shall show that they have carefully traced a case to its origin, and have excluded possible sources of error.

DIPHTHERIA.

This acute, infectious disease is quite prevalent in nearly all centers of population; according to its nature, attacking the children in some families and in some districts with fatal malignancy, and in others showing itself only in the mildest form of the disease. The general prevalence of diphtheria very naturally furnishes a most interesting theme for discussion at medical society meetings.

The KLEBS-LOEFFLER bacillus is believed to be the active agent in propagating the disease; also, that the first manifestation is local, and that the immediate absorption of the poisonous chemical products which are developed in the original nidus are productive of the well-known constitutional symptoms so frequently found in a sub-normal temperature, feeble circulation, nervous exhaustion and malaise.

It is in the characteristic exudative membrane formed in the throat, nostrils and trachea that the bacillus is found, while the accompanying œdema and swelling of the parts in this locality at once threatens the life of the patient. The option of the operation of tracheotomy or the insertion of one of O'DWYERS' laryngeal tubes is frequently presented, the latter being, by all odds, the one most generally selected. The physician who inserts a tube should be prepared to perform tracheotomy, as a condition demanding the one is very close to the border line of the other.

From the first onset of the disease until complete convalescence is established, rest in a recumbent posture should be insisted upon. Simple and easily digested nutrients should be given every two or three hours, only limiting the

amount of nutritious food ingested by the capacity of the stomach for its assimilation and digestion.

Alcoholic stimulants are called for to the extent of tolerance; heroic doses are necessary to counteract the depressing effects of the poison of the disease.

A topical application to the affected part of a solution of one grain of bichloride of mercury, dissolved in four ounces of per oxide of hydrogen, as first recommended by Dr. Waxham, of this city, is a most effectual remedy.

In this connection, attention is directed to the easy and complete solubility of bichloride of mercury in glycerine, after which dilution to any extent may be conveniently made.

The acute symptoms of an attack of diphtheria being tided over, the avoidance of disastrous sequelæ may often be accomplished by a seemingly long continuance of the patient in a restful, recumbent posture, and a keeping up of the stimulants and extra diet.

From the very first indication of the presence of the disease, the patient should be as thoroughly isolated as possible; upon the perfection of this isolation or quarantine of the patient depends the ability to control the spread of the disease, and no matter how many cases a physician may have at one time, his efforts at establishing a complete quarantine of each one should never flag.

All expectoration and discharges from the throat, nose and mouth should be received upon paper napkins or pieces of tissue paper, and immediately burned. The soft Japanese paper napkins, which are so common and easily obtained, answer an admirable purpose as handkerchiefs for the sick of diphtheria or other infectious disease. Being inexpensive, after using they should be immediately burned.

Asepsis and antisepsis in the treatment of infectious diseases are just as important to the physician as to the surgeon in capital operations.

TREATMENT OF THE INSANE IN GENERAL HOSPITALS.

As matters stand at present, there are two crying evils, if not more, in the provision for the care and treatment of the insane in nearly all parts of this country. One is the deficiency of

knowledge on the part of general practitioners, the other, deficiency of accommodations in the special hospitals provided for this class of invalids. It scarcely need be said that, in most of the medical schools of this country, opportunities for the study of insanity are either non-existent, or of the most meagre sort. Where any attempt is made at systematic instruction on this subject, it is usually by didactic lectures, without any clinical illustration, and it is safe to say that a large majority of graduates of our medical colleges have as good as no acquaintance with insanity, and only the most vague and indefinite ideas in regard to its treatment. As a rule, they are sensible of their deficiencies in this direction, and are apt to advise, in cases that do not show a tendency to pretty prompt recovery, that the patient should be sent to a hospital, but this is only a partial mitigation of the evil. The decision whether or not a patient shall be removed from his home and friends, and deprived of his liberty, is one that calls for a great deal of discrimination. We do not at all share the belief that the confinement of sane persons in asylums for the insane, either wilfully or through ignorance, is a common thing; on the contrary, we believe that the mistake is much more often made of allowing persons to go at large who ought to be restrained, both in their own interest and that of others. It does, however, sometimes happen that persons who are unquestionably insane are subjected to the odium and distress involved in an official declaration of insanity, when under judicious treatment they might have recovered equally well at home, and in many cases the chances of recovery are imperilled by injudicious treatment.

On the other hand, when it is decided to be best that the patient should be placed in a hospital, there is often most unfortunate delay owing to the overcrowding of these institutions. In almost every State in the Union, the accommodations for the insane fall far short of what is needed; the hospitals become clogged with an accumulation of chronic cases, and, as a consequence, the admission of acute cases is delayed till the time is past in which there is hope of recovery.

Both of these evils might be partially remedied by a measure which has been proposed in various quarters, and which has recently been strong-

ly urged by DR. J. BATTY TUKE, in an address delivered before the Royal Academy of Medicine of Ireland, and published in the *British Medical Journal*, the establishment of small wards for acute cases of insanity in connection with general hospitals. This would give medical students an opportunity for clinical instruction and experience which would be of great value to them and their patients in practice, and would increase the opportunities for prompt hospital treatment in cases that require it. If the policy were adhered to of not retaining chronic and, presumably, incurable patients, the stagnation of the population and crowding out of acute by chronic cases might be avoided, and it is probable that many persons would be more ready to send their friends to a general hospital than to an asylum for the insane.

The principal objection to such a plan is the disturbances which would be made by the patients. As DR. TUKE says, however, this objection applies with greater force to wards for delirium tremens, which is, in fact, one of the most objectionable forms of insanity in this respect. Such provision for the insane would not at all interfere with the work of the special hospitals, and it could hardly fail to aid in establishing a better understanding between the profession at large and the members of what has hitherto been, unfortunately for all concerned, the most isolated of medical specialties.

HOT SPRINGS, ARK.

We take pleasure in directing the attention of our readers to a letter in this issue of THE JOURNAL from DR. JOHN H. GAINES, president of the Hot Springs Medical Society. As he pertinently says, the professional conditions existing in that locality are anomalous. If every practitioner of regular medicine who has a patient who purposes going to Hot Springs, will give his patient a letter of commendation to some one of reputation in that place, the difficulty will be largely solved.

There are many thousand practitioners who do not know the names of the reputable practitioners at Hot Springs, and for that reason, DR. JELKS, of that place, has his professional card inserted on one of our advertising pages. Look at it; it is only a plain, professional card, with-

out puff or aught else, but the simple fact that it appears in that particular way in this journal is sufficient to endorse him as a reputable man, in good standing in our profession.

Patients going from one place to another, or even heads of families moving from one locality to another, may very properly, in fact, should, be given a letter of introduction and commendation to a reputable practitioner in the place of their destination. Such a course is a manifestation of interest in a patient and patron that is always commendable, and the practice should become as universal as possible.

MISCELLANY.

DR. HIRAM HAYDEN ATWATER, died at Burlington, Vt., aged sixty-three years, on August 19th. His father was a physician at Norfolk, N. J., but the son was educated at Burlington and at Woodstock Medical College, graduating in 1851. He first settled in Brooklyn, N. Y., but in 1861 removed permanently to Vermont. He was pension examiner for many years beginning in 1862. He was health officer of Burlington in 1867, and commissioner of lunacy for two years. Dr. Atwood had a special bent in the direction of obstetrics and was for many years the instructor in that branch in the University of Vermont. He was also one of the medical staff of the Mary Fletcher Hospital. He was the author of various contributions in the Vermont and other medical transactions and the *American Journal of Obstetrics*.

DR. WILLIAM COGSWELL, of Bradford, Mass., who died August 15, at the age of seventy-two years, was an ex-president of his State Medical Society, and the third one of that rank to go over to the majority during the present year,—Drs. Hosmer and Lyman preceding him by only a few weeks or month. His presidency occurred in 1876. He was a member of the Governor's council in the year following, and was twice appointed Medical Examiner for the Essex district, No. 4. He was an occasional contributor to the journals of articles on medico-legal subjects.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from November 7, 1891 to November 13, 1891.

Capt. William R. Hall, Asst. Surgeon U. S. A., relieved from Ft. Schuyler, N. Y., and assigned to duty at Angel Island, Cal. Asst. Surgeon Paul Clendenin, to be Asst. Surgeon with the rank of Captain, after five years' service, in accordance with the Act of June 23, 1874. November 5, 1891.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending November 14, 1891.

P. A. Surgeon J. D. Gatewood, detached from the U. S. S. "Despatch," and granted two months' leave of absence.

Official List of Changes of Stations and Duties of Medical Officers of the U. S. Marine-Hospital Service, for the Two Weeks Ending November 7, 1891.

Surgeon John Vasant, to proceed to New Orleans, La., as inspector. November 7, 1891.

Surgeon R. P. Murray, to rejoin station at Key West, Fla. October 30, 1891.

P. A. Surgeon C. T. Peckham, to proceed to Memphis, Tenn., as inspector. November 7, 1891.

Asst. Surgeon G. M. Guiteras, to assume command of Gulf Quarantine Station. October 30, 1891.

Asst. Surgeon C. E. Decker, assigned to duty at San Francisco, Cal. October 30, 1891.

APPOINTMENT.

Decker, Charles E., of Michigan, commissioned as Asst. Surgeon by the President. October 27, 1891.

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ORIGINAL ARTICLES.

PERSONALITY AS IT AFFECTS THE COURSE OF DRUNKENNESS.

Read before the Section of Medical Jurisprudence and Neurology, at
the Forty-second Annual Meeting of the American Medical Association,
held at Washington, D. C., May, 1891.

BY T. L. WRIGHT, M.D.,
OF BELLEFONTAINE, OHIO.

When the elements of the human character are served in any individual, there will be perceived a number—sometimes more and sometimes less—of intervening, interrupting, interacting, constitutional characteristics that, abstractly, are not really necessary to the completeness of human nature. And these characteristics, while non-essential, may nevertheless so far as the individual is concerned, dominate and decide in the aggregate and sum total of his history.

Such peculiarities in the elements of personality indicate imperfections in the constitutional minima of separate and distinct persons. In some cases they have been impressed upon the individual by ancestry—pointing to a history of disease, or of profound physical injury, or of mental and moral suffering, or inquietude, or fever. But whatever these lines in men's characters may be, or whence they come, or what they signify and portend—they are present in some degree obvious to the expert in every human being now inhabiting the

earth. The modifying qualities which may thus influence the nature of man, of course only the more deserving receive special notice; and of these, the members of the so called *neurotic family* more particularly demand our present attention. For the alcoholic constitution rightfully belongs to a singular group of incapables; and it is interchangeable with all the other distinctive neurotic affecting mankind. The simplification of the elements of matter, through its allotropic abilities, has its parallel in the great family of neuroses. Carbon, we are told, may exist in three material forms—as in the diamond, in coal, in soot, in the carbonates and in other

material substances. In a like manner, one neurotic form may be found masquerading in the features of some other member of the same family—dipsomania being interchangeable with amnesia or epilepsy, or some appearance of insanity; and conversely, these and other neuroses may become—either in the same person, or by heredity, transmuted into dipsomania.

This is not the place to speak of heredity at large. But to deny heredity is to deny parentage. He who cannot perceive both likenesses and contrasts in ancestry and posterity which denote unequivocally lineal descent, is, it seems to me, either blind or of dull apprehension. (a). The cast of the eye, the pose of the head, the set of the ears, the shape of the nose, the arch of the brow, the color and texture of the skin, the "cowlick" of the hair—all these and innumerable other special marks, indicate the power of heredity in the perceptible construction of the physical organism. (b). The mental and moral nature, the general disposition and tastes, the family likes and dislikes, the development of particular inclinations and propensities as life progresses, still more strongly if possible, testify to the reality of heredity. (c). Again, diseases tell the unfaltering tale of heredity through the transmission of epilepsy, insanity, heart imperfections, hysteria, dipsomania, somnambulism and a multitude of other undoubted pathological states. They point, not to perceptible and notorious physical conditions of the bodily organism; but they rather denote imperceptible changes in the ultimate structure of the brain and nervous system.

The evidence of heredity derived from physical conformation, and also deformation, is *direct*, and comes at once from observations conducted through the perceptive faculties; while the evidence derived through mental and moral properties, and from the transmission and transformation of diseases, is *circumstantial*. It consists of symptoms and indications, and phenomena. It is, therefore, most commonly unimpeachable; for it is composed of coincidences that mutually sustain and illustrate each other.

Heredity, especially the heredity of disease and criminality, is a doctrine as old as humanity—or at least as old as human suffering and guilt. It has been the theme of philosophers and sages

through all the world's history; and it enters largely into the elements of the Christian's hope, as well as the sinner's despair; for, in the disobedience of the progenitor of the human race itself, all mankind were smirched.

The effects of alcohol upon the human constitution may be divided into two classes or groups—those which are obvious to the senses of everybody—and those which are more remote, concealed, and unexpected. Both groups, however, have to do with the whole man—mental, moral, and physical.

Alcohol, for instance, acts openly and within the view of all in exaggerating the egotistic feelings. There is in drunkenness, not only unseemly boasting, and a claim to the possession of qualities in every department of life, superior to others, but there is a tendency to embark in enterprises far beyond the capacity of the person concerned. An habitual indulgence in the use of alcohol, produces a *custom or habit* of asserting pretentious and preposterous claims to excellence and prowess, so that the drinker is eventually degraded into a bragging and besotted imposter and nuisance.

The changes induced in the physiognomy, the speech, and the physical movements of the inebriate are universally recognized. Besides these perceptible bodily disabilities due to alcoholic impressions, there are a number of other notable mishaps that speedily occupy the field of observation. The liver, kidneys, stomach, brain, heart and lungs, show indications of functional—and finally of structural impairment and degeneracy. The interstitial substance throughout the entire organism exhibits a tendency to hyperplasia, although the features of this pathological condition are more pronounced in some localities than in others. Subsequently shrinkage is apt to occur. The consequence is, that a number of organic degenerations are likely to ensue. Nerve fibres in the brain may be implicated and torn in sunder; while the capillaries of the encephalon are, possibly, strangled and obliterated. These, and numberless other physical disasters are amongst the common effects of alcohol. They, and their symptoms, are open to daily inspection and inquiry; and they are liable as a matter of fact, to appear in all constitutions and persons impartially. There are, however, many exceptions of course.

But the usual and open effects of alcohol upon its victims do not stop with the acute or initial stage of inebriety. After a lapse of considerable time, possibly of years, the boasting of the early drinker, so absurd, so empty and frivolous, ceases to merit the name of mere boasting. It descends to the level of habitual and malignant lying. The lofty and assertive egotism, loving and seeking notoriety, is transformed at last, into a sullen and mean selfishness. Stiffened and bent over,

his muscles clamped by the shrinkage and inductions induced by alcohol affecting their sheaths, the chronic inebriate drags himself away with a difficult and crawling movement, shunning the sight and society of men. And the great highway he has traveled between the noisy and boisterous beginning of his career, and its woful conclusion, is the broad road of habitual drunkenness; wherein the daily sot staggers along, lonely and despised.

These are the obvious, the *common* characteristics of alcoholic drunkenness. They are often viewed, superficially, of course, as illustrating all the essential traits of alcoholism, physical traits, representing incapacity of action, moral traits, representing incapacity of responsibility, mental traits, representing incapacity of discrimination, reflection, choice.

But in real truth, hidden beneath these direct and sensible displays of the alcoholic power comprehensive and distinctive as they are, there may be discerned other traits of alcoholism, less obtrusive certainly, but probably not less important and far-reaching. Careful attention will reveal the fact that there are many profound and subtle influences exerted by alcohol upon the nature and welfare of man, that are quite impenetrable to the casual observer.

A good deal has been written, and justly too, upon the effects of the different kinds of alcohol on the human constitution. The constitution here meant is that of the average man; the several effects being due to differences in the article applied, and not to personal idiosyncrasies.

For example, it is known that *ethylic alcohol* (C^2H^6O) produces the agreeable and alluring movements of mind and body, that are so seductive to the inebriate. *Amylic alcohol* however called also *fusel oil* and *potato spirit* ($C^3H^{12}O$) produces very peculiar and serious consequences when mixed (in impure spirits) with the ethylic or common alcohol. It is to this substance that must be chiefly attributed the muscular instability and trembling, together with the profound poisoning of the brain that characterize delirium tremens.

But the purpose now is, not to apply different alcohols to *similar* constitutions, but to apply the common alcohol, that is, a similar (and less poisonous) alcohol, to *different* constitutions. The desire is to view the effects thence flowing upon mind and morals—upon life and responsibility—rather than upon the grosser physical organism.

It has already been noted that through the operation of the inevitable accidents of time, and the operations of inimical and destructive agencies, the constitutions of men often represent elements that are not essential to the completeness of human nature. These imperfections and liabilities are frequently present in such force

number, that they greatly influence, and may even chiefly direct the course of human life. The nature of some of these disturbing constitutional attributes may be seen in the several members of the neurotic family of diseases. It is not necessary to enumerate the individuals composing it. But it may be said that besides the characteristic members, there is a great multitude of persons in whom the neurotic features are imperceptibly shaded off into more or less indefinite degrees of completeness, until in fact, they are obvious only to the eye of the skilful and practiced observer.

In every community the neurotic family has many representatives bearing many names; and there are also relatives of that family that are as yet unnamed. Take for example the man wholly intent on piling up a mountain of wealth; riches that he neither can use, feel, taste, or in any conceivable manner enjoy in this life, nor take with him when he dies.

In such a life there is absolutely no rational object at stake. The man is a "crank." He is possessed of an undoubted neurotic constitution. He is closely connected with the insane family—perhaps a member of it. Not infrequently, amongst his offspring there will appear an idiot, or imbecile, or scrofula, or deformity. Quite commonly there are drunkards—one or more—true dipsomaniacs; and possibly a suicide. It is not exclusively the allurements and opportunities of wealth that so frequently wreck the families of rich men. It is owing, possibly to the inherited neurotic constitution, transmuted in posterity, from the craze of money getting, into the repulsive forms of epilepsy, dipsomania, and the moral insanity of useless and unsatisfying, but universal profligacy. True, sometimes the offspring continues in the paternal groove—and the neurosis of colossal fortune building goes on. But such is not the rule. The neurotic *bent* takes the form of unbalanced nerve equilibrium—*moral insensibility* being connected with *physical hyperæsthesia*. Here is, indeed, sensuality unrestrained.

All this is simply in illustration of the fact, that the neurotic constitution abounds in society more plentifully than generally has been supposed.

The effects of alcohol upon the mind and conduct, no doubt vary in some particulars, in each individual from its effects elsewhere.

But the gross and disgusting qualities of drunkenness that are common to all intoxicated persons, are apt to absorb the attention, to the exclusion of nice, but obscure idiosyncrasies.

There are, however, several specific qualities that alcohol impresses upon certain constitutions, that are not peculiar to drunkenness in general. These in fact are of frequent occurrence—and are of very great significance.

1. Some inebriates invariably exhibit signs of

irrepressible mania when under the influence of alcohol. Here is the true *mania a potu*—a designation often misapplied to delirium tremens. This is a condition readily developed in certain persons. The speech is loud and incessant; nothing can stop it. If admonition or even force is employed, the ceaseless chattering continues unabated. The topic may change, but not the talk. Frequently this state of alcoholic mania displays itself by producing an inclination, almost uncontrollable, to scream at the top of the voice and "make the welkin ring." The inebriate may not be entirely lost to the impropriety of this proceeding, and may pause a brief moment or two, and wonder in his silly mind what people will think of it—whether they will not think he is drunk. But all such sage reflections are speedily lost and swallowed up in the burning desire to "give them one yell anyhow." And so drunkards go up and down the streets, singly or together, shouting, singing and yelling to the utmost limits of their vocal capacity.

But these persons do not always confine their pranks to noisy demonstrations. Very often there appears a strong desire to "smash things."

Windows are broken, doors kicked down, furniture ruined, walls defaced, crockery thrown into the streets, and the spirit of utter destruction reigns supreme. All these things may take place without the slightest incentive of anger or malice. It is an instinctive mania of demolition; and it seems to be simply a process of occupying the attention, and relieving or *staying* morbid cerebral exaltation, by the act of *doing something*. It is scarcely necessary to say that positive and abrupt interference with the movements of an individual who is in such a condition of mania, might prove to be dangerous. It would be liable to arouse a feeling of ungovernable and insane rage.

2. There are many persons in whom alcohol develops a peculiar disposition that is dangerous to any community in which they live. These individuals, when under the influence of alcohol are morose, revengeful, homicidal. Such a spirit may exist in so great a degree of intensity as to amount to actual mania. It is by no means uncommon to read of murders committed in sheer wantonness by persons laboring under intoxication. Such individuals, without offense being given, without a personal acquaintanceship even, or a word being passed either way, will perhaps shoot down some one who, by chance, happens to be in their presence. But the homicidal tendencies of inebriety do not display themselves usually in quite so unexpected and truculent a manner. There are persons in every community who are known to be dangerous characters when drunk; and when they are perceived to be indulging in drink, the public invariably feels that serious trouble is liable to ensue.

These folks may be quiet and pleasant enough when sober, but as drink mounts to their brains, they become implacable and defiant. The memory of old slights and feuds, perhaps latent and for a long time forgotten, suddenly revives. The inebriate asserts that he neither fears nor regards consequences. He would "as soon die as live anyhow." An intoxicated individual possessed of such a disposition, is in a state of mind that is a menace to the public safety. He is really in a condition of insane rage—without limit or abatement—and thinks of nothing but killing and murder as remedies for all his fancied ills.

3. Other men again, possessed of constitutions peculiarly modified by extraneous circumstances, become affected, when under the influence of alcohol, with a nervous condition called by some *alcoholic trance*. Events that take place during the continuance of this remarkable state of the brain and mind, are afterwards but dimly remembered. Sometimes no recollection whatever of them is retained. This mental situation is brought on largely by the anæsthetic property of alcohol. The anæsthesia of alcohol so benumbs the sensibilities of the life of external relation that the inward movements of the organism, to some degree, come into consciousness; at the same time, common sensation and the perceptive faculties remain in abeyance. Ordinarily, in health, the reverse of this is true. Sensations and the perceptive functions engross the attention, and become the subjects of thought, while the inward movements of the organism are unperceived. This peculiar modification of the senses through the influence of alcohol may result in serious consequences. The objective and subjective sensibilities appear sometimes so indefinite, so mixed and intermingled, that one may be mistaken for the other, and the judgment be thereby misled. It is not difficult to see how motive and conduct may be influenced by the misinformation of the mind derived from organic sources.

No sensation or perception is absolutely trustworthy in itself. It must be attested by other senses; and the several comparisons must be weighed and accepted by the judgment before it is received in the mind as undoubted knowledge. But it is obvious that the dim and incomplete suggestions of automatic or subjective life cannot afford these necessary testimonies and proofs of their own accuracy. The mind, therefore, reasoning from the data of a false and impaired consciousness, is dragged from its moorings, and it accepts as facts the unsubstantial phantoms of a wayward and uncurbed imagination.

4. Leaving now the consideration of the peculiarities of individual constitutions which modify the phenomena and responsibility of the drunken state, attention is called to some fundamental traits which characterize races, tribes and fami-

lies, and which impress distinctive features upon inebriety.

The *Celt* possesses a physical organization in the highest degree sensitive. His appetites are strong, his aspirations are unbounded, his ideals are the exaggerations of fancy, and much beyond the reach of the actual. The Celt is frequently seen either in a state of radiant hope or gloomy despair. If he is an inebriate at all, he is an excessive drunkard. There is no moderation in his cups. His time is passed in getting drunk or becoming sober. His is a character of contradictions and extremes. In the Celt, the pleasures of sense are not always satisfied by their reasonable gratification. Sensuality in him often is bounded only by the limits of physical endurance.

When such a nature is addicted to the alcoholic habit, the indulgence is likely to be intemperate and destructive. The craving for intoxication is like that of dipsomania—almost irresistible. The Celt drinks the strongest liquors, and in great quantities. His will is feeble in the presence of temptation, for his passions are violent and unruly; and this is especially true with respect to intoxicating liquors. In a manner parallel with the dipsomaniac (whose will is weak from disease), the will of the Celt is weak through the constitutional organization of the race. The Celt, when an inebriate, may abstain *altogether* by a strenuous effort; but commonly, he cannot "drink in moderation."

It is a widely spread notion that, if the dipsomaniac would partake of small quantities of alcoholic liquor daily, his craving would be satisfied, and he would thus avoid his periodical spasms of intemperance. The fact is, that alcohol directly *weakens* his power of resistance by overcoming the inhibitory functions of the nervous system, and hypnotizing the moral nature. It therefore happens that the will, already feeble from disease with respect to the alcoholic temptation, is, in him, completely overcome, destroyed, when his brain is even partially affected by the alcoholic poison. The dipsomaniac may possibly, under the pressure of uncommon and superlative motives, abstain for a short time altogether; but he can never drink in moderation. The moderate drinker has moral inhibition to contend with; the total abstainer has not. Ordinarily, a single dram completely annihilates what little will or self control the dipsomaniac may have by nature, and a spell of drunkenness goes right on, till the physical organism is poisoned and exhausted. Indeed, the interference of the superlative motive, with the course of the dipsomaniac, is more of the nature of a brief substitution of some antagonistic *emotion*, stronger than the alcoholic crave, than it is an assertion of true will power. The intervening emotion may arise from grief, or overwhelming disaster. But, in

the nature of things, it must be temporary; and when it passes away, the neurotic tendency is resumed.

It may, likewise, be possible for the Celtic inebriate to abstain totally from alcoholic indulgence; but it is usually impossible to partially abstain. To him, temperance in the sense of limited drinking is quite out of the question.

These facts and considerations warrant the inference that the constitution of the Celtic race contains in its elements peculiarities that are not common to human nature in general, and that do materially modify the character of inebriety. Liquor-drinking among the Celts is impulsive and extravagant, and drunkenness is likely to exhibit its worst and most furious aspects. In this race, especially, may be engendered homicidal inebriety, maniacal inebriety, *trance inebriety*, to say nothing of the unbidden impulses to all manner of inebriate vice and crime; and all this, not from the stress of actual *disease*, either personal or through heredity, but from the natural and necessary influence which the peculiar constitution of the race exerts upon the phenomena of alcoholic drunkenness.

5. There is considerable difference, not to say contrast, between the constitutional peculiarities of the *German* and the Celtic races; and the modifications impressed upon the phenomena of inebriety by the distinctive traits of the German character are as singular and interesting as are those associated with the Celtic constitution.

Phlegmatic is the usual term employed to designate the German temperament. The German of to day is essentially the same as the German described by Tacitus. He is the unswerving and unchangeable *democrat* of history. He will possibly agree to surrender a part of his individuality into the keeping of society at large, in order to secure certain social and civil advantages—notably, protection and security; yet, should he be exposed to inconvenience on that account, he is ready to repudiate at once the compact. Touch him on what he deems to be his individual privileges—as, for instance, in the matter of temperance legislation—and he will deny the right of society to control him. He loudly inveighs against the curtailment of his “personal liberty,” and he will claim for himself the utmost individual license, rather than willingly submit to what he regards as slavery.

The Celt apologizes when he gets drunk. He explains that he has trouble to contend with, or disappointment, or sickness, or death; and he professes that he drinks to soothe an insupportable anguish of spirit. But the German never deigns to give a reason for intemperance. He declares that he has a right to get drunk, and, indeed, that drinking, so far from being harmful, is positively beneficial, and he verifies his opinions on the subject by bringing beer into his

family to be used by all its members. The German does not crave the strong and overmastering liquors that are so alluring to the Celtic nature. He seldom becomes helplessly intoxicated; but, unlike the Celt, he drinks with steadiness and regularity, and is not liable to be disabled with the deep prostration of inebriate excess.

Unquestionably, the beer of the modern German is the drink described by historians as the national beverage of the wandering tribes of that people in the days of Julius Cæsar. It is a drink containing considerable alcohol, yet so tempered with other ingredients that it sustains its inebriating influence steadily, and with little liability to sudden abatement. When the German arrives at the point of inebriation where the song and the muddy witticism break forth, he has little difficulty in maintaining his condition for a considerable length of time. Not so the Celt, who prefers the stronger drinks of whisky or brandy. His nervous exaltation is so glorious, so ecstatic, that he becomes intent on elevating his feelings and fancies, if possible, still higher, and the potations are redoubled, soon ending in mental disintegration, stupor and oblivion.

The desire for alcoholic indulgence in the German race is, therefore, influenced by the physical constitution of that race. The German calls for a peculiar and modified inebriety, and the ingenuity of his mind has discovered and prepared a material which exactly fulfills his wishes in the matter of inebriating drinks.

There is, perhaps, small encouragement in attempting to influence the German inebriate in the direction of abstinence. His inebriety belongs to his constitutional nature; it is *sui generis*. It is, in fact, a leading characteristic of his race, and has been recognized as such from the time of his first appearance in history. No amount of evidence seems to be competent to shake the faith of the German in the harmless properties and useful virtues of his national beverage. Beer is German, naturally and constitutionally, just as the instinct of personal liberty is German.

In an ancient period of time, the German people inhabited wild and inhospitable woods and morasses. Their houses were poor and open huts, set up without labor, and abandoned without regret. They were ever ready to shift their habitations and country for others that were more inviting. But, above all, for our present purpose, they drank habitually and copiously a kind of intoxicating liquor, “corrupted,” as Tacitus has it, into a “semblance of wine.” An important point is, these people have amended their houses, but not their drinking peculiarities.

The Scandinavians, a neighboring people, not only partook of this same alcoholic drink as long as they lived, but they believed that they would be “served with horns of mead and ale” after

death, in *Valkalla*, the hall of Odin — the paradise of heroes.

In Saxon England, the characteristic national revels were embalmed in song, for

“’Tis merry in hall
When beards wag all” —

a description totally inapplicable to the frantic and insane fury of Celtic intoxication.

The application of some of the principles advanced in this paper is of much wider extent than a superficial consideration of them would indicate. I will confine myself, however, to a single point.

Prof. Wiesmann, of Friburg, has recently claimed that “characters *acquired* by the parent are not transmitted to the offspring.”¹ There is nothing to show that the national habit of beer-drinking might not have been in entire accord with the barbarous customs and surroundings of the ancient German people. It is not impossible, indeed, but the habit may have been, under the circumstances, conservative and beneficial. But as the manners of the ruder times became softened, and good houses and pleasant homes arose on all sides, while the lights of civilization began also to glow and brighten, the ancient custom of drinking was not correspondingly affected. It was not abated, apparently, in the smallest degree. What was at first, probably, a habit merely *circumstantial*, became, by long continuance through ages, a habit *personal, central, constitutional*; and, when the ancient circumstances had disappeared, the hereditary mark, affixed to the constitution of the race, remained unmoved and unchanged. So deeply implanted is the proclivity for malt liquors in the German people, that it is questionable if a portion of the advantages and pleasures of civilization itself would not be surrendered, rather than the national and traditional habit of beer-drinking should be abandoned.

Illustrations of the influence of race on the characteristics of inebriety might be multiplied. The American race, the African race, and many distinctive tribes and families, furnish examples of the fact that the phenomena and responsibilities of drunkenness are modified by constitutional peculiarities. And this truth shows that in estimating the motive and guilt of imputed crime, the utmost circumspection, discrimination and industry should be brought to bear on the investigation. For it shows a weakness in the legal assumption that the criminal inebriate knows, before he drinks, what will be the effect of drunkenness upon the powers of his mind and will.

¹ Journal of Am. Med. Ass’n, 1890, Dec. 27, page 924.

TREATMENT OF THE OPIUM NEUROSIS.

Read before the Section of Medical Jurisprudence and Neurology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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It is not my intention to enter into elaborate statistics to prove the prevalence of the opium disease, or to discuss the causes which operate in its production; suffice it to say, that the habitual consumption of opium and its products does exist to a very alarming extent in this country, and that some of the causes which give rise to this malady are under our control; others are beyond our power. Nor do I purpose portraying the dire physical and mental manifestations resulting from the daily and prolonged use of the drug, interesting and instructive as the subject might prove to be, but rather do I wish to confine myself to a consideration of the treatment of this disease as it is presented to us, and indicate those methods which, in my hands, have proved most practicable, and, in my opinion, calculated to produce the best results.

In that plan of treatment which I am about to advocate, I cannot lay claim to originality, having closely followed the lines marked out by others in the plan of treatment known as “gradual reduction.”

In attempting to treat the opium disease, it is all important the physician should eliminate from the mind the *vice* theory, and consider the case in the light of a *disease*, which presents certain pathological conditions requiring skill, patience and sympathy to successfully combat, fully as much as when he is treating other forms of disease.

What the special pathology of this disease is has not been clearly demonstrated; but that such a condition exists can hardly be questioned, and has been strongly insisted upon by eminent authority.

When we find a patient able to take repeated poisonous doses of such a drug as opium, with perfect impunity, and when it is demonstrated that such doses are essential to his bodily comfort, or even necessary to sustain life itself, certainly there is the justifiable inference that some change in the animal economy has taken place, that a departure from normal action is set up, and that a pathological condition is established. Dr. Clouston, in the July, 1890, number of the *Quarterly Journal of Inebriety*, clearly recognizes the diseased condition, while Dr. Charles L. Hughes of St. Louis, in the *Alienist and Neurologist* for July, 1886, makes mention of it in the following language: “The long-continued use of opium of its salts engenders a disorder of the nervous system which is entitled to distinct recognition. Its sequence is as much a pathological entity as alcoholism, saturnism, hysteria or chorea.”

"Meco-neuro-pathy," he says, "is as much entitled to recognition as that well-known disease, epilepsy."

This assertion he fortifies by many interesting and undisputable facts, and in this connection, draws particular attention to, and points a vividly realistic picture of, the dire results consequent upon the sudden deprivation of the accustomed drug in an opium habituate. Many other eminent men hold the same opinion, and I look forward to no distant date when we shall see these assertions verified by microscopic demonstration.

These pathological changes appear to be situated, chiefly, in the nervous system, more particularly in the great nerve centers, and thus false impressions are conveyed to all organs of the body, thereby interfering with the due performance of their several physiological functions, producing disturbance and discord where harmony and normal action should exist.

Without enquiring further into the pathology of chronic opium poisoning, and accepting as fact that disease does exist, it remains for me to give a résumé of the methods of treatment advocated and adopted.

In the first place, we must bear in mind that there is no drug known to the medical profession which will cure this disease. We have no *specific* for it. Substitutes there may be, but substitution is not curing the neurosis, and the risk of producing a worse disease thereby requires extreme caution as to the selection of such a remedy.

Three separate and distinct modes of treating the opium habit are advocated and practiced: 1. That of abrupt and total withdrawal of the drug; 2, its rapid reduction; 3, that of gradual reduction.

As regards the abrupt withdrawal of the drug, I cannot for a moment countenance such a barbarous, inhuman and dangerous procedure, involving, as it does, the most exquisite torture, which no being on earth can fully realize save the opium habituate deprived of his opium. The shock to the nervous system is so intense as to make a lasting impression, which is manifested in the higher brain functions, and the risk of fatal collapse is unjustifiable. Words fail me to adequately express the reprehension I would cast upon those who set out on this despotic course, or to convey to you an appreciable idea of the misery and suffering it entails upon a most pitiable and helpless creature. I am astonished beyond measure to find so eminent an authority as Dr. Clouston, of the Royal Edinburgh Asylum, advocating and carrying this treatment into practice. The deservedly recognized marked attainments he possesses, the careful and sound observations he has made and recorded in other neuropathic disorders, the valuable work on in-

sanity he has published — a book which should adorn the library of every asylum physician — and the distinguished position he occupies among his confrères, gives weight as coming *ex cathedra* to anything emanating from his pen. I would not dare to thus criticise his treatment of the morphinomaniac were it not that I feel it a duty to humanity to protest against such cruelties being practiced upon a most unfortunate class of sufferers who are powerless to defend themselves. How a man endowed with the keen accurate perception and high educational attainments of Dr. Clouston, whose long and varied experience among the mentally afflicted must have developed in a marked degree that sympathy for suffering humanity which is so essential to the successful treatment of the insane, could ever advocate, much less carry into practice, such "heroic" treatment, is to me, at least, a problem incapable of solution.

In his article published in the *Quarterly Journal of Inebriety*, vol. xii, No. iv, page 311, he clearly recognizes the diseased condition we are now considering, and truly describes in terse language the subject thereof in the following words: "A morphinomaniac, in the advanced stage of his complaint, is a most miserable object in mind and body. He is manifestly diseased in all his nerves and most of his other functions. There is just one other being on earth who is more miserable-looking and more miserable, and that is the morphinomaniac who is being cured by enforced abstinence. The one is alive; the other is more than half dead. As we shall see, the fight is not altogether for the cure of the deadly habit, but in the first instance, to enable the patient to live through the cure."

Such are Dr. Clouston's accurate observations; nevertheless, in the very next paragraph he gives us a sample of his mode of curing this disease by *enforced abstinence*, which he justly admits causes a fight to keep the patient alive. Look at the pitiable subject he practices this on. A man, in the first instance, weighted down with a "distinct nervous diathesis," who at an early age suffered under a severe illness, which left him weak and sleepless. He "crams" beyond his strength to pass examination at college; buoys himself up on opium; he becomes the subject of rheumatic arthritis at the end of twenty-five years of morphia disease; under compulsion, he places himself as a voluntary patient in an asylum. He now presents the appearance of a "broken-down looking man," a physical and mental wreck. He was treated with beef-tea and brandy. We are told "the beef-tea caused diarrhoea, and had to be stopped. He could retain milk, liquid custards and brandy better than anything else. The heart's action got very weak, and digitalis seemed to strengthen it. *No morphia was given.* For a week he was horribly depressed and debil-

itated, and his life was certainly in danger." Under chloral and bromides, "he slept restlessly and awoke with a feeling of horrors." Contrary to what I would have expected, he weathered the storm and reached anchorage, but what a wreck, to use Dr. Clouston's own words! "His brain is irretrievably damaged in all its higher functions by his twenty-five years' continuous intoxication by opium."

How sublimely does the doctor take shelter behind this twenty-five years of so-called "intoxication by opium," and ascribe to this cause all the permanent damage done to the "higher brain functions." Granted that the opium was an important factor in the production of this dire result, did not the fearful ordeal the unfortunate victim went through tend to still further disorganize and produce a marked untoward impression upon an already mentally depressed and physically diseased condition; could the same man, crippled as he was with an originally unstable nervous organization, even though he had never tasted an opiate, have gone through a similar ordeal and retained a "*mens sana in corpore sano*;" would not a milder form of treatment have at least prevented so terrible a shock and given nature a far better chance to repair the inroads made upon the patient's health by the long continued morphia habit? What was there in the result that in the smallest measure compensated for the terrible suffering sustained in effecting a so-called cure. What advantage accrued either to the patient, society or science, by this barbarous treatment? Would it not have been better to have permitted the poor creature to continue his morphia, and in his own way enjoyed what few years were left to him to live, and when death was inevitable have quietly, gently and tenderly lowered him to his grave with as little pain as possible?

Two other cases are recorded by Dr. Clouston in the same article; the same line of treatment was adopted, the same ordeal passed through, similar results obtained. If this is success, if this is a cure, "I will none of it." I have said enough about the abrupt withdrawal plan of treatment. Let us draw a curtain over this horrible picture, hide it from view, and pass from so revolting a topic to the second plan of treatment, that of

RAPID REDUCTION.

I regret being unable to speak from experience as to the merits or demerits of the rapid withdrawal plan of treating the opium habituate. Such has not been my practice, therefore what I may say regarding it is gleaned from the literature pertaining thereto, more especially the publications of my friend Dr. Mattison, of Brooklyn, and those of Professor Ball, of the Paris Faculty

of Medicine. Both these gentlemen, as well as many others, appear to have met with marked success and satisfactory results. Certainly this method of treatment seems to carry with it many advantages. The time occupied in removing the drug from the circulation is comparatively short, from eight days or less to two or three weeks. yet it is withdrawn by such gradations that the shock to the nervous system is not so great or the danger of collapse so imminent as when the patient is at once deprived of all opiates; at the same time other remedies are employed which appear to have the desirable effect of quieting the nervous system and sustaining the patient whilst the final withdrawal is being accomplished, thereby safely carrying him through a crisis otherwise critical; when this object is attained the special remedies employed are apparently discontinued without inconvenience. Amongst such agents so employed may be enumerated, general and special stimulants, cardiac tonics and nerve sedatives, such as ether, alcohol, nitro-glycerine, sulphate of spartein, the various preparations of valerian, jamaica, dogwood, cannabis indica, belladonna, hyoscine, electricity, hydrocyanic acid, phosphoric acid, paraldehyde, chloral and the bromides, especially the bromides of soda in large doses mounting up to 3i per day. This latter has been especially brought to the notice of the profession by Dr. Mattison, in whose hands it appears to have proved a valuable remedy, fulfilling a most important office and safely meeting all required indications. As accessories, hot mustard, salt or electric baths, sustaining nourishment, careful nursing, and the best of hygienic surroundings.

As already stated, I have not followed out the treatment by rapid reduction, chiefly because I have found the more gradual method, though involving more time, eminently satisfactory and have thereby safely and successfully cured many patients whose enfeebled condition appeared to me to prohibit the more rapid method. I must also confess being somewhat skeptical as to the ease and freedom from pain with which an opium habituate can be cured by rapid reduction, and before abandoning that mode which I have found satisfactory, I would like more information than I possess as to pain, discomfiture, restlessness and general relaxation of the mucous membranes. Whether in the rapid reduction plan such phenomena are severe or merely trivial in character. Again, it appears to me that the time required to restore the general health and overcome the inroads made upon it by years of opium addiction is quite equal to the extra time involved by the gradual reduction method. Many writers state that fully six months should be occupied in such restoration, but I know in practice, the rule is a much shorter period spent under special medical supervision.

GRADUAL REDUCTION.

It now remains for me to consider the third mode of treatment, viz.: that of gradual reduction, which has been so ably described and advocated by Dr. Hughes, of St. Louis, and practiced by myself and many others. It is claimed to be rational, humane and a safe line of treatment, reassuring to the patient, and what is all-important, presents to their minds a feasible and comparatively easy mode of casting off these shackles which have so unrelentingly bound them for so many years, constituting them veritable slaves to an overpowering drug which is gradually but surely pressing them onward to meet a miserable and appalling death, which comes at last as a relief to a more pitiful and painful existence.

This treatment essentially consists in a slow, even and methodical withdrawal of the drug, without substitution; at the same time using all the means known to medical science to restore, as far as possible, the shattered nervous system, which is the universal condition of all these cases. The gradual withdrawal of the opiate is effected by decreasing the amount in fractions of a grain at each dose, and the following is a general outline of my mode of procedure.

Having by a categorical enquiry ascertained as nearly as possible, the amount of opiate the patient is in the habit of taking during twenty-four hours, I calculate its equivalent of morphia, then dividing this amount by the number of times it is necessary for him to resort to it during the day, a fair approximate of a simple dose is arrived at. This dose is carefully weighed, administered, and its effects noted; especially as to the following points: Does it sufficiently sustain the patient and keep him comfortable? How long does its effect last? When would a repetition of it be necessary to prevent depression, and would a smaller dose suffice. In a few days by careful observations of this nature, accuracy is obtained, a basis of treatment instituted, and reduction commenced. The rate at which reduction progresses must be governed entirely by the nature of the case in hand. Some patients will bear to be reduced faster than others; much depends upon the physical condition and the quantity of opiate consumed, those taking large quantities can, at the commencement, be reduced faster than where a less amount is the starting point. The guiding rule is, to remember there is a point at which the patient remains comfortable for a certain number of hours. That point can be noted between the extremes of stimulation by excessive opiate and depression consequent upon too small a dose. Upon the accuracy of adjustment of the dose to this point, depends the ease or the discomfiture of the patient, and success in treatment. The rate of reduction also

varies with the progress of the case. As a rule, when treatment is commenced with a patient taking, say 20 grains of morphia a day, reduction can be effected at the rate of about one grain every three days. As the quantity taken in twenty-four hours gets less, so also must reduction be more gradual, so that it will require four, five, six or even ten days to withdraw a single grain. When a point is reached at which only one grain is consumed in twenty-four hours the greatest skill, care, and caution is necessary, and to remove this single grain I usually employ from three to four weeks, gradually paring a fraction of a grain from each dose, and when you remember that that last grain is divided into perhaps three or four doses in the day, the final dose being brought down to so fine a point as $\frac{1}{1000}$ of a grain, you can appreciate the delicate and gentle manner in which it is withdrawn. No appreciable difference in the dose is noticed by the patient, no shock is produced on the nervous system, the dreaded upsetting of the stomach is avoided; there is little or no relaxation of the mucous membranes, diarrhoea is almost absent, or if present is so mild that the patient will not complain of it. There is no restiveness or inability to continue at a fixed occupation; sleep is usually good, natural and refreshing, and the patient finally slips from under the yoke of the demon opium without being able to note when he took the last dose. Emerging from his years of tyrannical bondage with a new lease of life, buoyant in spirits, physically improved and mentally bright.

Such a course of treatment necessarily involves constant and ever watchful care on the part of the medical attendant, and such physicians who are not prepared to devote time and patience to it had better not set out in the task. To those who follow it out faithfully, the result will amply reward them for all the trouble involved. Each dose should be put up by the physician himself. Accuracy in measurement is essential, none the less so, is punctuality in the time of administration; this cannot be accomplished without some fixed method to work upon. With such method the task is not so insuperable as might at first appear, though I doubt if the general practitioner could carry it out; the uncertainty of his movements would seriously conflict. In order to insure accuracy of dose and steady reduction the method adopted is as follows: When regular treatment is commenced two mixtures are compounded and the bottles labelled respectively 1 and 2. No. 1 is a mixture containing some of the vegetable tonics, with glycerine and water sufficient to form a 3200 mixture; to this is added one-half the amount of morphia per 3i you wish to give at a dose. No. 2 is precisely the same as No. 1 minus the morphia; 3ii are now taken from No. 1 and admin-

istered to the patient, the same amount is taken from No. 2 and poured into No. 1. The latter will now contain a fraction less morphia per 3i than the original mixture, that fraction multiplied by 2 represents the amount of reduction at the next dose. A record of each dose should be accurately kept; it is most important to be able to tell at any moment what the morphia strength of the solution is, as there are times when it is necessary to discontinue the reduction for a few days, or other periods when it is prudent to increase the rate of reduction by removing a certain amount of the mixture from the bottle, or an accident may arise whereby the bottle gets broken or some of the mixture spilt, etc.; under such contingencies, unless the strength of the mixture is absolutely known, it cannot be replenished without interfering with the even tenor of treatment. It is also desirable to know the rate at which reduction is proceeding, and when nearing the end, to be in a position to say that such a dose will be the final one, and be certain a crisis will not follow its withdrawal.

Such a record as I have indicated is easily kept in a case book with suitable rulings for the following headings: Date, time for dose, bulk of mixture, amount of morphia to 3i, quantity of morphia at each dose, daily amount of morphia, daily reduction, quantity of morphia left in mixture. It is but a minute's simple calculation to place the correct figures in the appropriate columns, and a glance at any time gives you accurate information. The calculations are best worked out in decimals and should be carried to the third decimal place.

Thus I have given you a general detail of the method I adopt, to evenly and methodically reduce the morphia. Certain modifications are necessary to meet special exigencies. Should reduction be going on too rapidly and signs of depression set up, the patient is easily righted by halting for a few days and holding him at the point reached. It is sometimes astonishing to see how rapidly the system will respond to this rest; in a short time the patient will be bright and buoyant, when, the mixture being replenished, reduction may again be safely resumed, though perhaps at a slackened pace. In some cases many such rests are required. In others reduction may proceed steadily from commencement to finish without inconvenience.

Concurrent with this reducing process our skill must be directed to restoring the physical health and bringing it as nearly as may be to a natural standard. Sustaining nourishment, if necessary repeated at short intervals, frequently a light meal at bed time, is of great advantage. But usually the appetite soon improves and regular meals are enjoyed. Pleasant recreations of a light nature short of fatigue, and out of door exercise should be encouraged. Tonics, chiefly iron

and quinine in tonic doses; the syrups of the hypophosphites is an admirable form. Some cases, however, do not bear the strychnine well; when it is tolerated it proves useful. In emaciated cases cod-liver oil emulsion will be found of service.

If from causes you cannot control, time is an important consideration and you are obliged to push the reduction more rapidly than sound judgment would dictate, restlessness and loss of sleep coming on, gr. $\frac{1}{2}$ doses cannabis indica ext., will prove a valuable aid. Hot salt baths with friction to the skin is of much value; 3ss. doses fluid ext. humuli often produces refreshing sleep, or occasional doses of chloral, paraldehyde or antipyrine at bed time, will be followed by good results. Electricity and stimulating liniments will allay the pains sure to arise if too rapid reduction is practiced. Salsiminum will relieve old neuralgias now likely to give trouble.

All opium patients are more or less troubled with constipation, oftentimes very obstinate. Keep the bowels regulated but do not make a "Balaklava charge" on the alimentary canal by giving drastic purgatives; paralyzed nerves resent such treatment. "Milder measures best prevail." A copious enema will relieve the lower bowel, and lubricate the passage for the discharge of hardened accumulations. A mild mercurial is often of much service. When it is desirable simply to clear the intestinal tract my sheet anchor is fl. ext. cascara sagrada and glycerine in equal parts.

Alcohol in any form I disapprove of, it invariably causes a demand for more morphia. Bromide of potash in sufficient doses to be of any use causes too much after-depression. Cocaine in the treatment of the opium habit I have tried and discarded as dangerous in the extreme.

In cases of double addiction of morphia and alcohol, or morphia and cocaine, I invariably at once withdraw the alcohol or cocaine and continue the morphia, giving sufficiently large doses to keep the patient comfortable. I can fight and conquer one devil but not two.

Whatever form of opiate is used, I follow Dr. Hubbard's recommendation to discard it at once and give its equivalent of morphia. So also with the use of the hypodermic syringe; I abandon that and administer morphia by the mouth. Patients are apt to object to this at first, but they soon realize the many advantages gained by the change. The same dose administered by the mouth will sustain the patient fully as well as when given hypodermically; it is however, less prompt in its action, but more lasting.

With very much broken down and highly nervous patients, I permit them to retain their syringe and morphia until they become accustomed to their surroundings and the new order of affairs; it is a source of much comfort to them, dispels

their fears and in my experience will not be used unless necessity requires it. In a few days, when confidence is established, the syringe together with all morphia, will be voluntarily handed to me, and the patient will place himself entirely and unreservedly under my care, willing to assist in the treatment of his case to the utmost of his ability.

Lastly, I would enjoin you to pour out your full sympathy towards the unfortunate opium habituate who has had a hard battle to sum up enough courage to present himself to you for treatment. He needs help. He needs care. He needs kindness. He has suffered long years of torture and deprivation; been tossed hither and thither, like a rudderless vessel, upon the turbulent waves of a cold and austere world; looked upon as a vicious outcast whose every action is treated with suspicion, his statements doubted, his case mismanaged. Give credence to what he tells you. Extend a rescuing hand to the drowning man. Pour oil and wine on his smarting wounds, let your full sympathy and aid go out towards him; you will then brighten a dark spot in the deepest of despair, and have the heartfelt thankfulness of an ever grateful fellow being.

DOES SCIENCE JUSTIFY THE USE OF ALCOHOL IN THERAPEUTICS? IF SO, WHERE? WHEN?

Read before the Section of Medical Jurisprudence and Neurology, at the Forty-second Annual Meeting of the American Medical Association, Washington, D. C., May 6, 1891.

BY ELISHA CHENERY, M.D.,
OF BOSTON, MASS.

The time is upon the profession to review and recast its notions concerning the use of the alcoholic compounds in the treatment of disease, rounded upon what they are, what they do, and what they do not do; for Argus-eyed science of our day shows alcohol to be widely different from what was supposed of it, in the years that are past. If our fathers drove their cows around a pump to make them give down the milk, we are not bound to do the same. Moreover, the liquor treatment has come to have a moral bearing, which both the human and the divine of our profession requires that we respect. And let me here add what the learned President of this Section has said: "The influence and teaching of the medical profession on the great drink question, is most imperatively demanded." Yet I radically differ from him in another statement: Medically and scientifically, the whole subject is the polar region of mystery." Certainly this speaks poorly of the candor of those who still prescribe it. If so, then why not leave it alone?

Bunyan got his hero into the Slough of Despond; but does any one in his senses believe that

the Slough of Despond is a necessary part of the pilgrim's pathway?

My subject compares to my time, to-day, like a man's hat to a boy's head. Hence I can touch only a few points, and that in the most unsatisfactory way—of leaving out most of the proofs of my positions.

ALCOHOL AS A RESTORATIVE.

This term includes the tonics—agents which increase strength and overcome languor—the promoters of the constructive metamorphoses, and the force producers. It excludes that which adds nothing, only whips out the strength the body already has. Restoratives are in great demand. The physician to-day prescribes them more frequently than any, if not all, others. He feels, when doing so, he is adding to the sum total of vitality.

Considering alcohol in this relation, we meet the fact that its chemistry is squarely against it. Not a particle is incorporated into the bodily tissues; so, to say the least, he is visionary in the extreme who prescribes it with the idea that it is incorporated, or that it incorporates anything else.

It contains carbon, as all carbo-hydrate food substances do; but that carbon cannot be extracted from it as from them. They all undergo certain changes, as chemistry shows; while it enters, pervades, and escapes from the body as alcohol, no proof of its transformation, either in the digestive tract, the blood or the tissues, ever having been found. This one fact of its indigestibility nullifies all arguments in its behalf as a force producer. If any contend that it does change, let them give the evidence.

The various symptoms, commonly attributed to this supposed change, are very satisfactorily accounted for from its known irritating and anæsthetic actions. Yet if we admitted all that has been claimed for it in this respect, we concede very little, for Voit and Subbotin say: "In the amount we can take without injury, its importance as a nutriment is too small to be considered." But we have no warrant for the concession.

That all the liquor taken cannot be recovered, we allow. It is the same when alcohol is mingled directly with freshly drawn blood: But the mere loss of a portion is not a proof that that portion changes and becomes useful. Such conclusion is not scientific nor rational. The loss of my knife is not proof that Jones has it, or that he stole it. As well contend that Stanley's "rear column" found Emin Bey. Better do as Hahnemann did—jump from the tangible of medicines into their spirituality. Right reason requires that we withhold our conclusions till we establish the premises. In the light of the foregoing, how unreasonable were the assumptions

of Dr Todd: "Alcohol is the most easily digestible and assimilable of substances. . . . It oxidizes in place of the tissues." Equally absurd is the theory that alcohol conserves tissue, as we showed in our essay last year.¹

That it is sustaining because some persons have lived a long time while taking it, is not conclusive. There is every reason to believe they would have done better without it. Had Dr. Tanner and the others who fasted longer than he, depended on alcohol rather than on the store of nourishment in their bodies with water to dissolve it, it is unquestionable that the undertaker would have had them long ere the forty or forty-five days expired. But, so far from acting as a restorative, abundant, careful observation shows that liquor actually depreciates the strength one has. It is the strong, not the weak, who bear it—not the young, the feeble, and those addicted to it. In other words, the strong can *resist* it, while the weak cannot.

Thus speaks Dr. Chambers: "Above all, I would caution against employing wine as a substitute for the true restorative treatment." "To call alcohol food," writes the Editor of the *British Medical Journal*, "in the present state of our knowledge, is an abuse of language." "The popular belief," says Dr. A. Mullan, "that beer and other alcoholic drinks are strengthening, is a mistake, a delusion, a mere superstition, which receives no support from science."

ALCOHOL AS A STIMULANT.

This class adds little or nothing to the bodily forces. They call out what was in store, using it up before its time. They act promptly, and for the time only. Their repetition is a matter of much discretion. They take from the sum total of vitality, and lead to exhaustion unless wisely guarded. Alcohol has so monopolized this term, that alcoholics and stimulants are at present quite synonymous. But is not the term mostly misapplied when applied to alcohol? When and where does it summon out the forces of the body the better to resist opposing forces? Never, except in very small doses, much smaller than we should be likely to give, if we give it with the idea that it is stimulating.

If we, for a moment, lay aside our pack of vague notions, and sit down at the deliverance of instruments of precision, we shall learn for certainty that any considerable doses do not stimulate, but depress and weaken. "Careful observations," Brinton states, "leave little doubt that a moderate dose of beer or wine will, in most cases, diminish the maximum weight a person can lift." So Liebig: "The circulation will appear accelerated at the expense of the force

available for voluntary motion, but without the production of a greater amount of mechanical force. It is attended with an inward loss of power." Prof. Marvaud of France, Zimmerberg of Germany, Richardson of England, and Martin of Baltimore, have wrought at this and find alike. According to Prof. Martin, as much as an ounce of whisky or brandy always lessens the force of the heart, though generally increasing its frequency. Prof. W. E. Ground, of Toledo, asserts "that it acts as a paralyzer from the first, through paralytic effect on the nerve centres, as in experiments where the inhibitory nerve is cut." Alcohol adds no heat. It strengthens neither body or mind; and this is not only science, but the common sense view of common experience. Alcohol agitates the system, while nutritive agents perform their work silently within, leaving other functions undisturbed. Moreover, it has certain drawbacks which stand in the way of its repetition, which proper stimulants do not have. Cold, or mechanical irritation to the stomach, increases heart frequency, and heart and vascular force. For the instant, small doses of spirits will do this, but, directly after, the absorbed portion begins to paralyze the nerves and capillaries. Hence heat, hot drinks, the aromatics, etc., are the proper means to warm a chilled person. They do not tumble the blood into the external capillaries as alcohol does, to the neglect of the more important internal parts. Whales are made to resist cold and not heat. Their exterior is in contact with the waters of the polar seas, while under their skins is a thick layer of non-conducting blubber, beneath which their warm blood circulates. Our bodies are made to resist both heat and cold. Exposed to the latter, perspiration stops, the skin contracts forcing most of the blood beneath the subcutaneous layer of fat, where its heat is protected. A drink of grog unlocks the skin and drives the blood to the surface, dissipating its heat, just as would happen to the whale if his blood were brought to the outside of his blubber, when it would lose temperature and his heart chill. Not only is alcohol bad in this way, but it does more: it puts a wet blanket over the internal fires, by shrinking and depressing the functions of the blood cells. So, so far from its being a stimulant to bring out the forces of the system to resist cold, it is a traitor, and appears doubly armed on the side of the enemy. Arnold had his good qualities; so has this. If a person has been exposed to severe cold, and is suffering internal pains and cramps from the vascular engorgement, no doubt alcohol has temporary helpful relations to the case, bringing the blood away to the surface. So has it useful relations to syncope, to shock, and to other cases of deficient brain circulation, where its irritation to the stomach, and not its absorption, may serve. Hence

¹ "Does Alcohol Conserve Tissue?" in pamphlet. Free to physicians who send to the author for it. See this much more fully shown in the author's "Alcohol Inside Out," 12mo, 350 pages, mailed for \$1.

what is used for the purpose should be strong. There are many other things as good, if not better. Thus the horizontal position, splashing the face and neck with cold water, cold or hot drinks, aromatic teas, camphor, ammonia, are appropriate, and are the people's remedies; while physicians may add amyl-nitrate, nitro-glycerine, and other things too numerous to mention. For years, nitro-glycerine has been the chief remedy of the writer. It is good to administer in anticipation of faintness from operations. So iron, and not alcohol, for anæmia and anæmic neuralgia; bismuth for gastralgia and pyrosis; not whisky, but the bromides, capsicum, digitalis, feeding, nutritious enemata, for delirium tremens; heat to the chest, camphor, ammonia, strophanthus, digitalis for the flagging heart; not alcohol, but digitalis, strychnia for dropsy; camphor, chloroform, turpentine, not liquor, for malarial chills; not liquor, but turpentine, ergot, salt, milk, for hæmorrhages; not alcohol in congestive dysmenorrhœa, inflammatory colic, dysentery, and a thousand other conditions in which stimulation is required. [In all cases of nervous exhaustion, or where the stomach is at fault, Dr. Archibald Billings says "restoration will not be expedited by stimulants," meaning alcoholics. Being, then, rather a hindrance than a help, good sense is on the side of the surgeons of certain corporations where accidents are common, in recommending that the employés be prohibited from resorting to liquor in cases of injury.]

ALCOHOL AS AN ANÆSTHETIC.

It would be well if this term, as applied to alcohol, were excluded from medicine. That alcohol by the skin, stomach, lungs, obtunds the nerves, paralyzes the muscles, stupefies the brain, needs no confirmation here. As persons see these effects, they name it according to their conceptions—intoxicant, narcotic, paralyzant, etc. I use the word anæsthetic, for, like Aaron's rod, it swallows up all the rest.

Anæsthesia is the most conspicuous of its effects. It is this which balms the feelings and brings the cheer; that smothers the aches and the pains; that exhilarates the mind, beguiles to repetition, to increasing doses, to habit, to inebriety, upsetting the mind, and raising the devil.

Alcohol is thus the very mad dog of *medica*. Nevertheless, it was the best anæsthetic known to our fathers. They also wore wooden shoes, things we need not wear. Ether, gas, chloroform, and many other agents have come to the fore, pushing it to the rear. They are not so deceptive, so seductive, so habit-producing, and those who handle them are not so likely to catch the Tartar—inebriety.

Having so numerous and efficient agents as substitutes, agents which have not its peculiar

back-cut upon the blood cells, I need not waste time in pointing out when and where it can be used in this direction; for it was the new cane the old man used while all the former ones were put in a brace in the wood shed. Neither need I stop to indicate the purposes its varied properties fit it to serve as an external remedy. I therefore pass at once to my last point.

ALCOHOL AS A PERTURBATOR OF THE ORGANISM.

The effects of alcohol on structure, and so, on functions, marks it as the most remarkable disturber of the animal body with which we are acquainted. Whatever else it may do, here it takes preëminence. Its etherial influence, to be sure, are the lulling wings of the vampire; in this is its mouth applied to the vital fluids. Its anæsthesia is the dummy hand of the thief; here are the concealed fingers which filch the purse. The mental exhilaration it produces is the smiling face of Brutus; this, his bloody hand which plunges the poniard.

With all that is known of the morbid changes produced by alcohol, how little is systematically considered and applied in practice? Last year I called attention to its power over the blood corpuscles, and showed a photograph of the extreme changes it produces in their physical character, in a portion of blood taken directly from a drunken man. This was right to the point. It gave ground for explanations and deductions otherwise impossible. Knowing the physiology of these corpuscles, as the gas carriers of the body, we do not require to be beaten with a club to comprehend that such alteration in their character must amazingly effect their important functions. But this is not all. The alcohol which gets into the interior of the corpuscles, acts the part of the dog in the crib and refuses the oxygen and the carbonic acid. Thus in a double sense their functions are depressed. In the paper referred to, I explained how it was that alcohol so affected their physical character, by showing that the spirit, having a great attraction for water and little or none for the substance of animal membrane as such, by the laws governing osmotic action, compels the water to come out of the cells and mingle with it on the outside. Not only does it thus collapse the cells, but it also similarly affects all other moist structure throughout the body. Who has not seen this in mucus, in albumen, in the protoplasm of rapidly healing wounds?

What it does under the eyes on the outside of the body, it does on the inside, and the more so in proportion, as they are watery and the cell walls delicate. In this way are the tendons, the muscles, the nerves, the connective tissue and the organs affected. Is there, therefore, difficulty in comprehending why the bodies of drinking young men grow old apace? An agent that will steril-

ize the cells of a pup and prevent their evolution, thus holding his body throughout in the condition of a Chinese woman's foot, must and does pervert the structures of those who drink it. Here, then, we have the key to the alcoholic pathology—the changes so conspicuous in the bodies of old toppers, and so surprisingly numerous in the bodies of moderate drinkers suddenly cut off by other causes. This shows why we cannot cure persons made sick by alcohol while the habit is continued; why surgical cases act badly in alcoholized patients; why the healing of wounds is not expedited but hindered when liquor is given; why the white blood-cells are crippled and protoplasmic movements arrested by this agent.

Here is the key that unlocks the mystery of fatty degeneration, fatty bloating. Is it strange that such organs as the kidneys, the liver, the stomach, the brain and spinal cord, the vascular system, should undergo fibroid and cirrhotic changes by so active an agent and acting in the way that alcohol does?

Here is the explanation why the bodily temperature can never be raised by alcohol, but always lowered; and why this antipyretic action cannot be rendered serviceable in practice. Here is its philosophy in weakening brawn and brain. Every other function must be depressed when the blood-cells are strangled.

Now, I ask, what reason have we to expect good from it in the treatment of any or all diseases of the respiratory system? They obstruct oxygenation and the elimination of carbonic acid. Does not alcohol do the same? They weaken; this, more. If pneumonia blocks pulmonary circulation and æration, and by heaping excessive labor on the heart, tends to overwork it and exhaust it, determining heart failure; this, more. Strange that we should lose our heads as philosophers in the face of alcohol. Would that we return to the lancet for this grave disease, relieving the volume of blood upon which the embarrassed heart has to act, and be done with this most irrational and fatal treatment of it, ever employed. If the structural changes in the lungs of consumptives hinders oxidation and weakens the body, does not liquor do the same, albeit it diminishes the cough by times? Is our philosophy correct when we give alcohol in disintegration with defective depuration, as in fevers and the like? Does it not itself increase depuration by hindering the absorption of oxygen and the expulsion of the waste, represented by carbonic acid and urea?

Certainly if it can obstruct the waste in a well man till he stinks from head to foot, it can never purify the blood of one already foul. These questions, with scores more that might be asked, being based on solid grounds, leave me little room to answer, Where? When? Give alcohol? There is nothing in physiology more certainly scientific-

cally demonstrable than that alcohol changes the structure of the blood-cells, and, through these, the functions dependent upon them, and as their functions are vital and no hindrances to them can conduce to the restoration of the sick, the reasons for alcoholic medication are driven to the polar region of barrenness. They cut the tap-root of the popular liquor therapeutics, and no human invention can make it again bear green leaves. Alcohol, when in any degree of concentration, is opposed to ptyaline, to pepsine, to pancreatine. It is contra-indicated in bilious cases, cirrhosis of the liver, gout, Bright's disease and diabetes; the last of which it can directly produce.

But this paper is not written in ignorance of the fact that many good physicians use it. Were it not that many do, the statements herein would not be worth the making. I may be wrong; we all err. In a neighboring city an astute physician stood up in a medical meeting and deposed in favor of a certain pill, relating numerous cases where he had given it with good results. Another physician followed, showing the same pills which had been gathered from the former's patients, they passing whole, only losing their sugar coats. A prominent member of this Association had a fever case which got into the typhoid state; his kidneys being obstructed, I counselled efforts to open up the kidneys and skin and so relieve the nervous condition. The doctor was obstinate, believing in "bridging the chasm" with "the bridge that brandy makes," and gave it. His bridge was rotten. I now have a patient under my care who told me he had taken quite half a barrel of different liquors on the prescriptions of this same physician, and began to improve the moment he left the liquors off. A clergyman called on me, relating that his child had been sick with the typhoid and got to that condition where the doctor said nothing but brandy would save him, and accordingly brought a bottle of it to the house. The clergyman took it, threw it into the back yard, made a liberal portion of beef tea and gave it. Soon the sweat started, and the child fell into a sweet sleep and was better the next morning. The doctor spoke of the change and attributed it to the wonderful power of the spirit. I warned that clergyman for not deceiving his doctor, and allowing him to go away, strengthened by the success of the brandy in this case, to give it with increased confidence.

It may have been good in cases of fever, diphtheria, etc., where large doses have been given and which appeared to be beneficial. If so, I am very positive that it was owing to its power over the peculiar microbes in these diseases, sterilizing and rendering them inert; for we know that alcohol, at fifteen or twenty per cent. strength, overcomes and practically destroys most of the germs about us, even the blood-cells

themselves, as I have witnessed, producing death. And it is a most wonderful provision of nature against fatality from the drink habit, that the medulla oblongata is so much more resisting to the power of alcohol than the rest of the body, continuing its functions when all else is practically dead, keeping the heart beating and the lungs moving, fanning out the poison from the prostrated blood-cells. Were it not so, how often would the undertaker's service be required to what it now is!

I know I cannot answer all your questions, yet I trust I have said enough to show you that this subject is not all a mystery, but full of interest and instruction, if we but come out of the clouds and study it from ground principles. I came up the historic Potomac, and, though the oar, the sail, the smoking steamer, seemed to indicate that the current was devious, I am sure its steady flow is to the ocean beyond. Though I note some drift-wood held in sluggish side currents, some cross currents, whirlpools and waves, I am as satisfied that the stream of alcohol, whether taken foolishly, from habit, or on the advice of physicians, in large or in small doses, has but one general course, one end—the fathomless deep.

Comparing the results of my practice with the practice of those who use it, until something more scientific in its favor comes up, some new revelation is made, the day is far distant when I shall send another Brutus after my Cæsars.

INSANITY AS RELATED TO CIVILIZATION.

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Insanity may not be, as is so commonly and confidently asserted, "a disease of civilization"—but conditions essential to the phenomenal manifestations of insanity obtain so rarely among savages and lower animals, and so frequently among civilized people, that, in the absence of contradictory testimony, the assumption that it is so, would seem to be justified. The question then becomes pertinent and interesting: What constitutional modifications are effected by, or with, the process of civilization, whereby human beings are rendered more liable to become insane? Who shall answer?

By common consent the medical profession is looked to for intelligent answers to all questions pertaining to insanity, and the insane. Is the profession qualified to so answer?

Qualified or not, there are members of the profession ever ready to respond; the least qualified, often, being the readiest. Capability to talk volubly, or write voluminously, about insanity

—or any other subject, for that matter—with an affectation of learning, is a "gift" not unknown to the profession, however reputable it may be, as a body, for its thoughtfulness and reticence. Such 'gifted' members are, as a rule, however, not the most trustworthy, as expounders of principles, or historians of facts.

By interrogating less pretentious, but ordinarily intelligent members of the profession, respecting the relation of insanity to civilization, it will be found that various opinions are entertained by them on the subject; each having some value when properly estimated; but based upon foundations of facts too narrow and incongruous to stand the test of rational criticism.

Nor should it be anticipated of such men, whose preliminary studies, and subsequent habits of thought and observation have been in the way of specializations, rather than generalizations, should grasp the question as propounded, comprehensively; or respond to it otherwise than by some more or less dogmatic assertion of personal opinion; citing this, that or the other disease, habit, accident, or incident, of civilization, as the true cause of insanity; overlooking the fact that certain physical conditions, not common to the race, but essential to the manifestation of the phenomena of insanity, must have obtained, individually, before such "causes" could become operative; regardless of all other circumstances.

The first man, for example, will assert, as an indisputable proposition, that alcoholic intemperance is the cause, direct or indirect, of all manifestations of insanity!

"The demon alcohol" as this man sees it, has superseded all old fashioned "demons" of whatever genus, or species, to whose machinations all diseases, and death itself (when not inflicted by a supremely good spirit), were attributed by our, not very remote, ancestors; and should now be held responsible, in their stead, for all the misery of mankind.

Nor is this man alone in his belief. A good man, and true, within his own bounds—devoting all the energies of being to an ameliorating of the more painful conditions of his fellow-men—his notions are not singular; nor is his conduct peculiar to himself.

Limited and fanatical by nature; cramped by long service in a narrow field of labor; feeling voluminously, but thinking neither comprehensively nor rationally; toiling ever in the penumbra, if not the shadow, of superstition; habitually personifying phenomena, and ascribing general conditions to special antecedents as causes; having witnessed with increasing dismay, from year to year—in his professional as well as his civil capacity—the unstayed ravages of this apparently pitiless and unsparing monster—invading every land and every household—insidious

as pestilence; greedy and insatiable; feeding like a fabled dragon, with ever increasing appetite, upon all that is estimable in human nature; imperishable, and many-headed as a hydra; from whose many mouths proceed, incessantly, falsehood, delusion, violence, and crime; each giving instant birth, in turn, to all manner of kindred but ever-varying vices; it is not to be wondered at that he should so believe; nor that, being so filled, he should go his way vituperating alcohol, and all persons not already enlisted in a crusade of extermination against it—however hopeless of success the fanatical adventure. The measure of his understanding is full. It were folly to overflow it.

The next man, closely related to the first by capabilities, education, and experience; differing, temperamentally, only so far as to be able to accept the inevitable with less friction, or emotion, will insist that the insanity of civilization is a result of overwork, and mental strain, and other incidents of modern life, characteristic of a 'fast age and greedy people!'

In addition to an exhaustive arrangement of our most active and enterprising business men, because of their habits, and methods, of accomplishing ends without regard to means, or consequences—straining every fibre of being in pursuit of unworthy objects, success outweighing every other consideration, he may be expected to impeach everything modern without discrimination or reason. Under present circumstances, as the world seems to him to be wagging, women are everywhere disqualifying themselves for healthful maternity (the chief end of female existence) by unreasoning devotion, in their social relations, to absurd fashions; and criminal violation of natural and statutory laws in their relations of wives and mothers. Men are as unmistakably deteriorating, physically and mentally, because of such "maternal delinquencies," and their own acquired habits of life. And children are being dwarfed, or destroyed, by thousands, through the instrumentality of modern schools, and newfangled notions respecting the education of youth—both methodical and institutional.

"Doctor of Medicine" though this man be—and presumably familiar with the fact, if not its significance—that an evolution of science has been taking place within his time, by which old opinions and beliefs have been, and are being, revolutionized; his own profession, even, metamorphosed, dignified, and advanced—he is one of those, nevertheless, who are being carried forward by the stream of human progress somewhat reluctantly; lagging in the rear of the advancing column of humanity—marching like a discontented soldier in retreat, with vizor reversed, looking ever rearward. Intellectually myopic, he sees neither before nor after, to any considerable distance. He is not without his uses.

The burden of the third man's response will be an ascription of insanity to the general disorder of society incidental to existing forms of government and social customs; it being one of the penalties inflicted by nature upon mankind for violations of natural laws of justice and equality—effected more immediately by the excesses of the stronger, indulged while rapaciously feeding upon and devouring the weaker; and the privations that the weaker (and worthier) are compelled to suffer that the strong may luxuriate. All characteristic, he will say, of civilization.

Intellectually a hybrid—a mixture of philosophy and lunacy—this man sees no prospect—no possibility—of anything but disorder, under existing circumstances—and wonders, only, that more persons do not "go mad." As he sees things now, all governments are despotic, cruel, and unjust; established by usurpations of power, and maintained by violence and fraud.

The corner stone of each is a denial of the natural, inherent "rights of man," individual and social; upon which rests a superstructure of fictitious distinctions, and class privileges, abhorrent to justice, and obnoxious to the welfare of the race. All institutionalized religions as he sees them, are alike dogmatic and intolerant; affecting recognitions of the "fatherhood of God, and the brotherhood of man,"—but practically, historically, denying such recognitions; and representing God as an immensely magnified human despot, and but a few select people as worthy of divine favor. So, too, all social organizations are outgrowths of erroneous ideas respecting the natural equality of human beings, and their rights and duties under all circumstances, in every relation of life.

Our fourth respondent—a modern specialist by chance—may be expected to assert, with characteristic energy, and apparent sincerity, that one half of the insanity to be met with now-a-days, is attributable to untreated surgical diseases of the reproductive organs of women; amenable to treatment, generally overlooked by ordinary practitioners, and wholly neglected by the medical officers of our hospitals and asylums for the insane.

Congratulating this man, and his confrères in opinion, upon so great a medical discovery, including the localization of mental function in the female organism, presuming, analogically considered, that the other half of insanity, not accounted for gynæcologically, is ascribable to diseases of the male organs of reproduction, we may profitably pass to an examination of the next "expert," however superfluous further inquiry may appear to be.

The fifth interlocutor—he may as well appear now—to whom the problem under consideration appears to be exceedingly simple—will maintain, with an air of conscious superiority, the asser-

tion that insanity, in all of its phases, is but an upsetting of feeble-minded persons by trivial circumstances; such as disappointment in love, loss of property, or friends; grief, jealousy, or religious fervor; fear of hell, and the like; because of their ignorance, and lack of common sense. He thinks that people "go crazy" on certain subjects, such as religion, spiritism, christian science, or some other form of fanaticism; leaving out of consideration any possible morbid material element, however important such consideration may be to a scientific solution of the problem.

Superficial, vain, voluble, vulgar, probably profane; it may be anticipated of this man, who has never really thought of insanity as having any definite relation to civilization, that while casting about for material wherewith to amplify his discourse, he will bethink himself of sexual excesses and abuses as causes of insanity, and having struck the dead-level of his intellectual tastes, that he will descant indefinitely upon the familiar topic of sexual appetites and indulgencies; relating many anecdotes, and bringing into bold relief the fact that he looks upon all emotionally pious, as well as hysterical women, as erotic; all spiritualists as "freelovers;" and all ministers of religion as lascivious, if not licentious.

Fortunately, we do not have to listen to all that such men have to say, and may so leave him to indulge his own egotism and vulgarity, while we interrogate a worthier, if not a wiser man.

And here he is—slow and irresolute of speech at first, gaining time, as it were, for reflection, we need not be surprised by a final announcement of the conclusion, that civilization has nothing to do with insanity, generally or specially considered. Nor by the assertion that, according to his personal observation, nearly, if not all insanity, is of syphilitic origin. Candid, conscientious, resisting plausible testimony, fearing to be misled, he will attempt to fortify his position by facts; stating that he now recalls a great number of cases of insanity caused by syphilis—many—several—two or three—one well marked case; that of a man, about 45 years of age, who had, etc., etc. When a worthy brother begins to recite clinical history, from memory, in support of an absurd proposition in medicine, he is liable to become tedious.

Should we meet a seventh witness in this line of investigation, let us hope that he may be a man who has had sufficient mental training to comprehend the full purport of a question when plainly stated; as well as one who has dug through all merely superficial indications of valuable matter, and struck his intellectual pick into a matrix of pure ore. Not that surface indications are of no value. To an experienced miner they may be of great significance. But incompetent observers are liable to overestimate their intrinsic

worth, or to mistake them for wholes of which they are but fragments. The uninstructed, indeed, often deceive themselves by holding fragments of truth in such relation to the eye as to permit them to occupy the entire field of vision. It is thus that the massive sun is sometimes totally eclipsed by the tiny fragment of a world, called the moon.

But what need of further illustration? No well-informed man, capable of weighing testimony, and applying general principles to special subjects, can fail to recognize the lack of breadth and comprehensiveness of commonly entertained views of the subject before us. Nor will it escape his observation that, vary as they may, they are all of the same general type, or purport; each consisting of certain limited speculations respecting the relation of insanity to certain "exciting causes," without an allusion to any inferentially essential precedent, constitutional preparation for the efficient action of such "causes," or the part played by civilization in effecting such conditions. While the fact is, not one alone of all the many exciting causes of insanity—not all of them combined—can produce the phenomena of insanity by their influence upon other than exceptional persons. Nor can all of the facts pertaining to the subject be taken into consideration and harmonized, by such limited speculations, however satisfactory they may be to those who entertain them.

It is a fact, for example, that neither alcohol, nor alcoholic intemperance, is peculiar to civilization. It is a fact, also, that alcoholic intemperance has been steadily decreasing among the more highly civilized peoples, for half a century or more, while insanity has been as steadily increasing.

It is a fact that our hospitals and asylums for the insane are populated, almost exclusively, by very ordinary people; men and women who have never suffered great vicissitudes of any kind, undistinguished persons, who have neither aspired nor endeavored, struggled nor attained, to any considerable extent, in any direction.

It is a fact that while men may, and do sometimes, destroy themselves by overwork and mental strain, in their pursuit of wealth, or fame, or means of personal distinction or enjoyment, not many ambitious, capable, successful men of affairs become insane, however effected, or premature, their dissolution. Rare exceptions to this rule attract attention because of their rarity.

It is a fact that the opulent and luxurious, who have become such by personal enterprise, sagacity and acquisition of means, however destructive of morals, or of health, their habits may become, do not, many of them, become lunatics.

It is a fact that, while pelvic and abdominal diseases of women are more frequently and intelligently recognized by the profession now than

formerly, and, because of modern modes of dressing, and pernicious habits of preventing conception, or arresting gestation, on the part of many women, they may be more numerous and prevalent, it may also be affirmed that more women, ten to one, have been consigned to hospitals for the insane—victims of needless or unskilful surgical operations, performed by ambitious and pretentious gynecologists, than have ever been restored to reason by the most commendable and skilful abdominal surgery.

It is a fact that no people have ever achieved greatness, or accomplished anything worthy of existence as men, without government—the worst being better than none—and it is likewise true that all civilized governments have been growing more and more beneficent, more and more considerate of the welfare of the governed, of all classes, for the past hundred years or more; growing in grace with the evolution of rationalism and morals that has characterized the present century; extending their blessings, more especially, to the weaker and more dependent classes.

It is a fact that “our time” is notable for its freedom from fanaticism, and the grosser features of superstition; there never having been a time before—strange as it may sound to the worshippers of antiquity—when the world was so nearly rational as it is now.

It is a fact that, historically considered and contrasted, this is not a licentious age, nor are we a lascivious people. Nor is syphilitic contamination, thanks to science and a more general diffusion of useful knowledge, nearly as extensive or destructive now, as it was formerly, among civilized peoples.

It is a fact that savage peoples have been, and are now being, decimated, if not annihilated, by the ravages of syphilis—notably the native Hawaiians, and Alaskans—conveyed to them from civilization, without any history of concomitant insanity whatever.

It is a fact that while the longevity of individuals has not increased by, or with, the progress of civilization, the longevity of the race, so far as affected by civilization, has increased, owing to modern triumphs of peace over war, of science over pestilence, of reason over superstition, and a constant increase of food-supplies, and betterment of habiliments, including all manner of habitations, and the consequent survival of large numbers of persons otherwise destined to inevitable extinction.

How, then, does civilization affect the conditions of mankind—what does it do to men, physiologically or historically considered, whereby they are rendered more liable to become insane, than are savages or barbarians?

The answer, so far as present knowledge enables us to answer intelligently, is neither difficult nor complex. It is this:

Civilization, by its extensive and intricate co-operative combinations and activities—its arts, sciences, inventions, ethical perceptions, and consequent benefactions, not only rescues from otherwise inevitable dissolution, but nurtures, matures, and enables them to multiply by reproduction, multitudes of organically defective individuals, of the human species, in whose structure inhere certain potentialities, not common to the race, but essential to the manifestation of the phenomena of insanity, under any given combination of circumstances.

This answer is both explicit and comprehensive, and harmonizes, not only the facts already recited, but all facts pertaining to the subject, among which the following are offered as authenticated and suggestive, viz.:

The fact that all peoples now classified as “civilized,” have become such by transitions from barbaric and primitive conditions; there being no evidence acceptable by science, that any originally civilized people ever existed, or that any people having become civilized spontaneously, ever relapsed to primitive, or intermediate barbaric conditions.

The fact that man, as related to the universe, is not an exceptional being, but subject to the same general conditions and contingencies that determine the becoming, continuance and disappearance, of all other specializations of living matter.

The fact that the same germinal and seminal prodigality that characterizes nature everywhere, forcing into being multitudes of superfluous individuals of varied capabilities, for whose subsequent development adequate provision has nowhere been made, necessitating an inevitable and immediate conflict and “struggle for existence,” in which the weaker, or otherwise defective, must necessarily perish, is characteristic of mankind, as well as of other animals of the same order.

The fact that the first intelligent effort of mankind (called “instinctive” when exhibited by lower animals), to mitigate the severities, and supplement the deficiencies, of nature respecting the welfare of the race, consists of coöperative combinations of individuals for the accomplishment of ends otherwise unattainable; such as the capture and appropriation of food-animals, too strong or ferocious for individual prowess, or defense against enemies of like character seeking to make food of them; combinations by which two or more individuals are enabled to live where but one could have existed under other circumstances—the weaker ever being, if existence is to them a benefaction, the real beneficiaries.

The fact that all subsequent, successive, efforts of mankind, having in view the conservation of individual existence, instigated by organic sentiments, or love of life, of self, of offspring, and finally of the race, resulting in the various phases of civilization, are but extensions of, or evolu-

tions from, primary, simple, coöperative combinations of individuals, whereby the disastrous indifference and negligence of nature have been supplemented, and counteracted, in an ever-increasing ratio.

The fact that in the transitions from primitive conditions to civilized states, common to all civilized peoples, a constitutional diversification of individuals, as in the domestication of lower animals (a similar process), always takes place, corresponding in variations from original types to the degree of cultivation reached at any given time, finally necessitating recognitions of classes, or breeds, consisting of individuals presenting certain peculiarities, sufficiently similar to relate them as a group, while, at the same time, distinguishing them from the common stock. Classes among civilized peoples whose characteristics elevate them above the common level of humanity, and classes correspondingly depressed.

That the insane constitute a "class" of society cannot be rationally denied; inasmuch as the constitutional conditions essential to the manifestation of the phenomena of insanity do not obtain uniformly in the development of mankind—but few only of a given number of persons being capable of manifesting them.

That the insane, as a class, are defective, is also self-evident; defective manifestations of phenomena always implying defect of mechanisms, the activities and conditions of which are thereby reflected, the mechanisms of mind not excepted.

The constitutional peculiarities of the insane are, likewise, correlatable with the peculiarities of other defective classes of society, such as the anatomically asymmetrical, the physiologically unstable, the intellectually incompetent or eccentric, and others whose abnormal conditions find expression, phenomenally, otherwise than by manifestations of mania, melancholia or dementia; responding to excitation, sometimes, by exhibitions of hysteria, epilepsy, neuralgia, or uncontrolled impulses to irrational violence, unresisted propensities toward sensuality or intemperance, and not infrequently, a general perversity of feeling and perception, constituting the diathesis of crime.

The inference is therefore forced upon us, and may not longer be resented, that with every increase of coöperative complexity and activity—embracing larger and ever larger aggregations of individuals, with increasing comprehensiveness of purpose, and efficiency of action—attended by continuous growth of capability and accumulation of knowledge, from which evolutions of humane sentiments and ethical perceptions are inseparable, the number of individuals rescued from premature dissolution will increase, and the lower will be the stratum of "unfitness" from which such rescuing will take place.

What! Insanity, and other blemishes of civilization, attributable to the apparent benefactions, instead of the evident malefactions, of civil life? Impossible! Good and evil are not so closely and inextricably related.

So it may seem to the multitudes whose notions of good and evil are as incoherent as their knowledges of the universe are limited and superficial. But no well-informed, thinking man will shrink from the conclusion. The law of compensation is never suspended. Mankind can afford to accept the facts, or conditions of civilization, even as thus depicted. Reciprocity is the highest practical ethic of which mankind is capable. Public as well as private charity is quite as beneficent in its influence upon the doers, as upon the intended receivers of benefactions. He who neither apprehends the past nor trusts the future, is liable to suffer irrational doubts, and groundless apprehensions.

Civilization as a whole, or general condition of human affairs, is harmonious, however discordant its component features may appear to be when considered separately, or unrelated.

The higher and lower degrees of civilization are as continuous, yet discreet, in their relations, as are the upper and lower surfaces of any object geometrically considered. Whatever is higher, ideally or materially, grows out of, rests upon, and is inseparable from, that which was before, and is lower, or beneath.

He who should anticipate ripened fruit, without the necessary antecedents—blossoms, leaves, twigs, branches, stems and roots of a perfect tree, would be scheming both ignorantly and idly. He schemes as ignorantly and idly who hopes or expects to attain and maintain a high degree of civilization without a long series of antecedent lower degrees, with which the higher must remain forever continuous. Disrupt civilization as it now exists, and separate the highest attainment from its antecedents, as we pluck fruit from trees, and it would as inevitably, if not as speedily, begin to perish. We cannot think of civilization as thus dismembered, if we try, without confusion of thought.

As an illustration of civilization as it now is, take for example any great city of the world. It is a perfect illustration. Barbarism never built a great city. Look at its population! The richest and the poorest, the noblest and the vilest, the strongest and the weakest of mankind are here inextricably, yet discreetly and harmoniously, associated. Look at its streets and buildings! Temples, palaces, and magnificent mansions, with all of their accessories, many and beautiful, are here! But miles on miles of narrow, filthy streets, flanked by common dwellings, cottages and hovels, constitute an inseparable corollary. Imagine now, if possible, a transformation! Wave the magic wand of ideality, and

behold! these buildings all converted into palaces of equal beauty, sumptuousness, and magnificence! And these inhabitants—all transfigured! all strong, noble, intelligent, learned, rich, luxurious, free, and secure in every right or privilege acquirable by man! Alas! such a condition is not maintainable! Humanity may be crushed, but cannot be elevated, to a common level. Crush society to a common level, and the result will be a common condition of barbarism or brutality. Utopian philosophers and pious dreamers, of all ages and nationalities, have imagined and predicted the coming of all manner of impossible conditions of society, equally chimerical, because implying unification of human qualities, capabilities and necessities, and a final solidarity of good, and disappearance of evil. But whether pietistic or political, such prophetic dreams have ever been discredited by disappointment, as they ever will be, so long as the conditions of mankind are determined by growth and environment, and not by miraculous interpositions of hypothetical influences, which cannot be rationally contemplated, because of implied disturbances of the relations of sequences to antecedents, which it is impossible to regard as otherwise than inevitable.

ARE CONSERVATIVE AMPUTATIONS ALWAYS IN THE BEST INTER- ESTS OF THE PATIENT?

Read before the Mississippi Valley Medical Association, St. Louis, Mo., October 16, 1891.

BY CHARLES TRUAX,
OF CHICAGO.

In pre aseptic days, amputations were properly governed by an inflexible rule which taught that the first duty of the surgeon was to save every possible ounce of tissue, because, first, experience had demonstrated that the nearer the point of amputation approached the trunk and the broader the stump, the greater the risk of life; second, it was generally believed that in all cases the usefulness of a stump increased with its length.

These principles, still taught in all of our standard text-books (save one) and having been practiced by every eminent operator from the first records of surgery down to the days of asepsis, are in general use to day—although the conditions forming the basis for their advocacy no longer exist, at least in their former weight and importance.

The first of these principles was formulated at a time when pyæmia, septicæmia, or like complication endangered the life of nearly every patient who submitted to an amputation, so that even if the patient survived both the original condition and the operation, his life was still in danger from some one of these dread maladies.

It was found that this danger increased with the size and extent of the wound, so that surgeons were unconsciously led to vie with each other in their efforts to amputate with the least sacrifice of parts.

When the principles promulgated by the eminent Lister came into general use, they practically sounded the death knell of those forms of disease resulting from external wounds, and rendered obsolete the infallibility of the so called "golden rule" which taught conservatism in amputations under all circumstances, for statistics collected from the records of nearly one thousand surgeons, embracing only such amputations as have been performed since 1885, prove conclusively that there are at least some exceptions to this rule.

Admitting it to have been a fact that, in the earlier history of prosthetical art, the longer the stump remaining after an amputation the greater was its value, it does not follow that it is so today, and I trust to be able to demonstrate that in some classes of cases and with certain limits the value or usefulness of a stump actually decreases with its length.

During the past quarter of a century the development of prosthetical science has advanced with a rapidity unprecedented in the history of the art. The first of the two great causes which stimulated this development may be found in the dreadful carnage and mutilation observed in the late Civil War which left thousands of veterans maimed by the loss of one or more limbs, for whom it was necessary to provide artificial substitutes.

The second, and now the most important factor in producing injuries necessitating amputation, is the great increase in the volume of machinery in use and the velocity with which much of it is operated. These two causes, combined with others of minor importance, have increased the demand for artificial limbs and developed a competition that has called forth the best efforts of our inventors, resulting in improvements so wide and varied in their extent as to place American artificial limbs, in point of efficiency and durability, second to none. To so high a state has the art been advanced that, under favorable conditions, makers of such appliances are enabled to construct artificial legs that permit the wearer to live and move in society without his being known or considered as a cripple.

An examination of a given number of applicants for artificial legs will, I think, demonstrate that only a moderate number are what may be termed favorable cases; *i. e.*, those permitting the use of the most perfect and complete forms of mechanism. Aside from these, a fair number could be selected for which limbs could be constructed that would furnish means for locomotion which, though more or less imperfect, would

be accepted by the patient as the best results that could have been provided, on account of the nature of the disease or injury. The balance of these applicants (and of the three classes they would scarcely represent the minority) can, at best, only secure unsatisfactory or miserable means of support, and for these subjects, unless they be in quite comfortable circumstances, life can only promise to be a burden.

Experience and investigation has convinced me that the percentage of favorable cases can be largely increased provided surgeons will familiarize themselves with the necessary mechanism of ordinary artificial legs and the relations existing between them and the stumps on which they are to be worn, and select their point of amputation accordingly.

If, out of a given number of cases, say only one-third of them are at the present time favorable ones, is it not possible to largely increase the number by amputating only at points which will provide stumps that are favorable? And if this be possible, is it not the duty of surgeons to familiarize themselves with these points and the reasons for their selection and, as Stephen Smith has well expressed it, "Have a humane regard for humane surgery?"

Notwithstanding that the old Golden Rule has been firmly impressed upon the minds of graduates and practitioners by the writings and teachings of standard authors from time immemorial, it is still a fact that a fair percentage of the more careful, conscientious and progressive surgeons of the present day have for some time been operating to a greater or lesser extent on an entirely new system—not only a new system but one that is in direct opposition to the ideas and principles that for ages have been accepted without question.

The old system as previously stated, was in all cases to perform an amputation with the least possible sacrifice of parts. The new system does not interfere with this in stumps for prehensile purposes, but in operations in the lower extremities it teaches that amputations should be made at such points as will enable instrument makers to construct the best possible form of artificial substitutes even if in so doing the surgeon removes tissues that, under former methods, would have been permitted to remain. The question of saving an inch or two, or even more, in the length of a stump is of no importance if its removal will secure a stump permitting the application of a more perfect and satisfactory appliance.

The conditions essential to a favorable stump for locomotion are a conical form without sharp corners or protuberances, with cicatrix underneath and preferably at the posterior margin, and length enough to obtain a good bearing in the stump socket. If these requirements are

complied with and the stump possesses the necessary firmness to bear the contact with the socket, the patient, if properly fitted, will be enabled to operate the artificial part of the member in such unison with the natural portion that detection of the former is almost if not quite impossible.

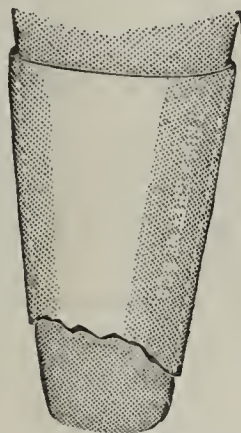


Fig. 1. Showing Section of a Thigh Socket.

The section of a thigh socket here shown will, I think, show why it is necessary that leg stumps should be of a conical form and may, at the same time, demonstrate that our text-books are in error when they teach that stumps should be so formed that they may bear more or less of the weight of the patient on their ends. When

a section has been made through a bone, if the cut surface be not covered by an osteoplastic operation, no weight can be borne on the end of the stump. If surgeons will make their amputations at proper points not one ounce of weight need be carried by patients on the ends of their stumps.

It is a fact easily proven that, in most cases where a stump is so formed as to necessitate its bearing a portion of the weight of the patient on its end, it is usually a source of annoyance, because it not only forms an inferior means of support, but as the late Dr. Gross well expressed it, "it is constantly liable from the slightest causes to pain, irritation and ulceration."

As the internal diameter of a well formed socket decreases from above downwards (see illustration) and as its carrying power depends largely on the lateral pressure of the stump against its converging walls, it is evident that if the stump be of a conical form it will distribute the weight or pressure surface over a larger extent of the limb.

These sockets are carved or cut from the inside and so shaped that they fit the exterior of the stump as accurately as a kid glove does the hand, consequently the more circular the stump and the more nearly free it is from all uneven surfaces, the more perfectly it can be adjusted.

The position of the cicatrix must depend largely on the method employed in the operation. In selecting this method the surgeon should, by all means, locate the cicatrix to one side of the end of the bone and posteriorly if possible.

In amputations of the femur the value of the stump to the patient increases with its length until it reaches a point where this length precludes the use of what is known as the long or cylindrical form or joint.

In order, then, to choose the proper point in amputations of the lower third of femur, it is only necessary to learn the amount of space requisite for the working of this joint and where possible if there be no increased risk of life, operate

accordingly. By actual measurement, we find that in an adult this joint can be inserted and successfully used in an artificial limb provided three inches are removed from the lower end of the bone. Here, then, is the point of election and the one that should be adopted if circumstances be favorable.

In amputations of the tibia, the value of the stump also increases with its length, and the same rule should be applied as in the case of the femur, excepting that the point of election should be the juncture of the lower and middle thirds. Here the amount of surface exposed to the lateral pressure of the socket is not of as much importance as in thigh stumps, because the weight of the body is principally carried by the condyles of the head of the tibia. These afford a firm, unyielding surface which, when once well fitted with a socket, will, if necessary, carry the whole weight of the patient. It is, however, preferable to secure the advantages of a natural, conical-shaped stump by amputating below the calf, and thus increasing the bearing surface, and removing a part of the pressure from the head of the bone. Further, the amount of leverage increases with the length of the stump, so that if the operation be performed at the point indicated, the patient will have better control over the artificial limb than if the operation be at a higher point.

This point of election not only gives to the patient every benefit offered by amputations at or near the ankle, but it enables the instrument maker to display his mechanical ability to the greatest possible advantage.

Following injuries involving the middle and upper thirds of the tibia, many works on surgery advocate the leaving of short tibial stumps, that the patient may be provided with what are known as knee-bearing legs, or those in which the weight is taken on the anterior aspect of the flexed limb. It seems almost unnecessary to present arguments to demonstrate that such limbs would be clumsy appliances at best, owing to the imperfect connection between the natural and artificial portions. Short tibial stumps usually contract to a greater or lesser extent, and for this reason should be avoided. I would say that an amputation should not be performed within 3 inches of the joint. In cases where only from 3 to 4 inches of the tibia can be preserved, and there be no danger from inflammation in the joint, it would seem better, from my standpoint, to excise the remaining portion of the fibula. Its presence is of no benefit to the patient, while its removal facilitates the forming of a more conical stump, and insures a greater degree of firmness therein. Several cases have come to my knowledge, where the pressure of an artificial limb socket on the remaining fragment of fibula has proven a constant source of pain and discomfort, and one or two cases of ulceration I believe were due to this cause.

The fundamental principle that forms the basis for the new theory is the fact that the successful operation of a limb, whether natural or artificial, depends largely on the action of its joints. Therefore, unless the surgeon amputates at points that not only leave the natural joint intact, but provide below it sufficient leverage to swing the substituted portion, he will interpose obstacles in the way of the instrument maker that will prevent the construction of the best form of appliance.

To amputate through the knee or ankle-joint is to assume the position of the dog in the manger, for the remaining structures occupying the half of the space of the joint are of no use to either the surgeon or patient, but take up room that should be used for joint mechanism. The natural half of a joint remaining after a knee or ankle disarticulation is of no more use to the patient than the odd half of a pair of shears, for only in a limited number of cases can much, if any, weight be borne by the ends of the bones.

It is true that external knee-joints of the carpenter's rule pattern, such as are used in deformity braces and a sample of which is here shown (Fig. 2), can be employed after amputations either through or close to the articulation. Experience, however, has demonstrated that this joint is not a suitable one for long continued service if compelled to carry a weight.

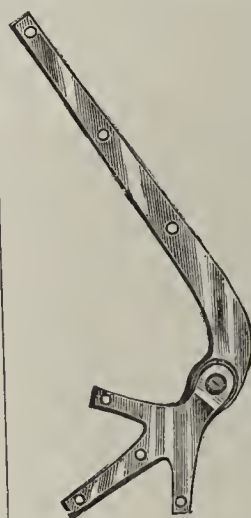


Fig. 2. Showing Rule Bearing Joint.

It required only a brief experience in the construction of artificial limbs to satisfactorily demonstrate to my mind that patients in large numbers are being crippled annually by tarsal and tibio-tarsal amputations, but it was with considerable hesitancy, even after an extensive investigation, that I first dared to advise the entire abandonment of all operations of this class.

My researches extended through the range of mechanics, I examined the laws governing the physiology of locomotion, inspected patients and their appliances from an esthetical standpoint, investigated the relative first cost of the various forms of compensative apparatus, and the approximate yearly expense necessary to keep them in order, collected statistics showing comparative results following tibial on the one hand, and tibio-tarsal, tarsal and tarso-metatarsal amputations on the other, ascertained the risk of life in these two classes of operations, and liability to re-amputation, and placed on record, for the first time, statistics showing the practical value to the

patient of these two classes of stumps, and in each instance arrived at the same result (*North American Practitioner*, July, 1891); and I stand here to-day in defense of this position, knowing that, so far as I have any knowledge, I am opposing the teachings of every standard work on surgery except the writings of Stephen Smith.

From a mechanical standpoint, we find the same principles operating in the case of the ankle as in the knee-joint, and unless the stump be short enough for the insertion of some form of a cylindrical joint like the one here shown

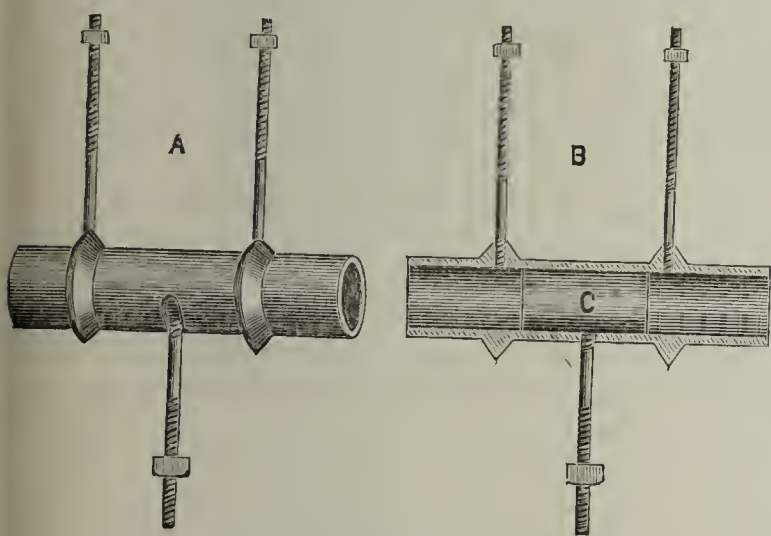


Fig. 3. Showing Cylindrical Joint.

(Fig. 3), or its equivalent, the manufacturer is compelled to resort to the rule pattern previously referred to. The latter, besides wearing away quickly, will not withstand heavy lateral strains. The operation and use of these rule joints is very unsatisfactory to the patient, and the necessity for their use should be avoided.

The laws of the physiology of locomotion show conclusively that the foot, or a portion of it, cannot be adequately substituted. It is true that Syme's operation will admit of the use of a whole artificial foot, but as its successful operation must depend on certain forms of construction and methods of attachment, unless there be space for the insertion of such mechanism, the foot will be more or less helpless and the patient crippled. Ease and grace in walking are not attainable unless the lower limbs are provided with levers or propellers by which the body is moved forward. Remove these levers at or below the ankle, and the patient is compelled to assume an awkward, limping gait, even if assisted by the best artificial substitutes made.

The principle of the lever is well exhibited in the flexion and extension of the foot while walking, the foot itself being the lever, the *Tendo-achilles* furnishing the power, the ground the fulcrum, and the body the weight to be moved. To take a complete step forward necessitates the raising of this weight, because the trunk, at the time when the forward foot is planted on the ground (being then midway between its two

oblique supports), has dropped until the pelvis is on a lower plane than before the step was commenced. The completion of the step requires the raising of the trunk to its original level. This elevation of the body is accomplished by the exercise of the lever power, because the extension of the foot then in the rear forces the body forward until the trunk is in a position perpendicularly over its advanced limb, and the step completed.

In walking, the heel and ankle rise on the ball of the foot, and by the lengthening of the limb caused by the extension of the foot, the body is forced forward, and is raised by the changing of its supporting limb from an inclined to an upright position. This falling and raising of the trunk produces the undulating motion so noticeable in walking.

If one or both of these levers are amputated at points where they cannot be artificially replaced, an awkward, limping gait will result. If one lever be removed, it becomes necessary for the patient to take a shorter step with the sound limb, otherwise he would be unable, for want of the extension previously referred to, to complete the movement—at least, without undue exertion. It is evident that the longer the stride, the lower the level reached by the pelvis, just as increasing the length of the base of a right-angled triangle decreases the height of the perpendicular, provided the hypotenuse remains the same. The taking of a short step with the sound limb, however, does not entirely compensate for the loss of a foot, but usually compels the patient to adopt a lurching movement of the body. This lurching, due to rotation of the pelvis upon the hip of the sound limb, is frequently assisted by a greater flexion and extension of both knees. These movements, whether made use of singly or conjointly, are directed toward the accomplishment of the same result, viz., the forward propulsion of the body, and the consequent elevation of the trunk until it has reached the level occupied by it before the step is commenced. Patients who have suffered amputations of this class, after being provided with artificial substitutes, rarely walk as well (and to walk at all requires the outlay of more labor) as where the amputation has been performed through the tibia. I have examined several patients with double tarsal amputations, and in each instance found them taking short, mincing steps, while those with double amputations of the tibia usually take full-length steps.

From a financial point of view, artificial limbs for Symes operations usually cost as much as if made for amputations at a higher point, but stumps resulting from osteoplastic, sub-astragaloid, medio-tarsal and tarso-metatarsal operations can be furnished with appliances at about two-thirds their cost. A full-length artificial limb,

however, *i. e.*, for amputation above the ankle, can be purchased from most manufacturers with a five years' guarantee as to durability, during which time it will cost practically nothing to keep it in order. Such a limb will wear from five to twelve years, while those for stumps ending at or below the ankle will usually last only from two to four years, and be out of order a good part of the time at that.

More important than, or rather the cause of the loss of the lever principle following tarsal amputations, is the breaking down or total removal of the arch of the foot, and it matters not which one of the specific operations of this class is employed, nothing is left of the arch that affords even a slight degree of elasticity; in short, the string of the bow is gone and the bow itself broken.

From a statistical point of view, I find that out of 2,135 tibial amputations reported to me as being performed between the years 1885 and 1891, 90.7 per cent. resulted in healthy stumps; 3.1 per cent. suffered re-amputation, while 5 per cent. died, leaving only 4.3 per cent. of stumps (including the re-amputations) upon which compensative appliances could not be worn. Of these tibial cases, 962 were seen by the surgeons after they were wearing, or had attempted to wear, an artificial limb, 86.9 per cent. of which walked with an easy movement and a comparatively graceful step.

Of 658 tarsal and tibio-tarsal amputations reported at the same time, 82.7 per cent. resulted in sound, healthy stumps; 8.3 per cent. underwent re-amputation, while 3.2 per cent. died, leaving 14 per cent. (including re-amputations) upon which prosthetical apparatus could not be worn. In this class of cases, 169 were seen after attempting the use of compensative appliances, 54.4 per cent. of which could walk well.

If we can judge correctly from the foregoing statistics, in every 100 cases of each of these classes of operations, we may reasonably expect the death loss to be in favor of tarsal operations as 5 per cent. is to 3.2 (but it must be borne in mind that in the majority of these cases reported the tibial operations were performed in preference to the tarsal, because of the greater extent of the injury, and the difference in mortality may safely be attributed to shock or complicating injury, and not to the fact that the operations were made nearer the trunk), while the ratio of re-amputations necessary will be in favor of tibial amputations as 8.3 is to 3.1. The number of healthy stumps resulting from these operations would be in favor of tibial operations as 90.7 is to 82.7, while the number of unhealthy stumps would also be in our favor, as 4.3 is to 14. Of those who attempt to wear artificial substitutes, we may expect to get favorable results in 82.9 in tibial and 54.4 following tarsal operations.

Owing to the unsatisfactory service resulting from the use of artificial arms and hands, the surgeon is not warranted in adopting radical methods in treating injuries or disease in the upper extremities. On the contrary, he should exhaust the last resources of conservative surgery and save all of the parts possible.

Instead of the old conservative so called Golden Rule which has formed the basis for amputations for ages, I would recommend, from my experience as a manufacturer and from the foregoing review of the question, the following: Avoid amputating within three inches of the knee joint; do not amputate between the metatarsal bones and the junction of the lower and middle thirds of the tibia; at all other points save all you can, and you will, in every case, have done the best for your patients.

In conclusion, I will state that from the evidence at my command, I believe that I am justified in stating that the so called conservative amputations of the lower extremity are not always in the best interest of the patient.

75 and 77 Wabash ave.

SOCIETY PROCEEDINGS.

American Public Health Association.

Nineteenth Annual Meeting, held in Kansas City, Missouri, October 20, 21, 22 and 23, 1891.

FIRST DAY—MORNING SESSION.

The Association convened in the auditorium of the Warder Grand Opera House, and was called to order at 10 A.M. by the President, Frederick Montizambert, M.D., F.R.C.S., D.C.L., of Quebec.

Prayer was offered by the Rev. Samuel N. Neel.

After considerable preliminary work, the reading of papers was proceeded with.

Dr. C. D. McDonald, of Kansas City, read paper on

THE CAUSE AND PREVENTION OF INFANT MORTALITY.

He gave statistics showing that infant mortality soon after birth was 20 per cent. One of the principal causes was the exposure to a low temperature—a chilly room—soon after birth. He had been present when it had been necessary to wear an overcoat in a room where a newly born child was exposed to bathing. Forcing sleep by soothing syrups to overcome the effect of this exposure was another evil. Another trouble was the forcing of food, such as crackers and water and whisky into the young, into the stomach of the newly born. The mother was

refused to nurse her child from selfish reasons deserved the censure of the community. Statistics show that in the first year the infant mortality when the child is fed by artificial food is 50 per cent. With natural food the mortality was but 10 per cent. The best artificial food was pure cow's milk. Sterilization by chemical process was not thoroughly a success because vital principles cannot be supplied by chemical process, but sterilization was preferable to impure milk.

No starchy substance could be digested in the infant stomach. Starchy infant food is converted by the chemical processes of the stomach first into sugar, then alcohol, and then acetic acid. No sensible farmer would attempt to feed a calf hay. Hay is the natural food for a cow as much as solid food is for a man. Improper dressing—thin clothes—was also a prolific source of infant disease.

Prof. W. W. Daniells, of Madison, Wisconsin, thought that no one should be allowed to sell milk in cities unless he put his dairy establishment under the control of the sanitary authorities.

GLANDERS IN MAN,

was the subject of a paper by Dr. Joseph Sharp, of Kansas City, Missouri.

The doctor classed glanders with acute infectious diseases, such as tuberculosis. The especial feature of the paper was a report of a case which occurred in his practice, and in which he pointed out the difficulty of diagnosis in this obscure disease and gave an outline of the methods for microscopic examination, together with the best methods of cultivating the bacillus of glanders. The paper recommended that for preventing glanders persons who came in contact with horses having open sores or discharges from the nose should disinfect the hand with a solution containing a tablespoonful of equal parts of glycerine and carbolic acid in a quart of hot water, and ten grains of corrosive sublimate in a quart of water. In his report of the fatal case he had treated, that of a painter who became inoculated through a sore on the hand while handling an afflicted horse, the speaker aroused much interest.

Dr. Paul Paquin, of Battle Creek, Mich., in the discussion, reported a collection of seventeen cases of glanders in man which he had collected in the State of Missouri while living there. As an instance of the virulence of the poison, Dr. Paquin told of one man who, driving behind an infected horse, was struck in the eye by a spray from the beast's nostrils, a case of glanders developing rapidly and terminating in the man's death.

Probably the most interesting paper of the morning was that of Chief Justice Horton, of Kansas, on

THE NECESSITY FOR MORE STRINGENT LEGISLATION TO REPRESS EMPIRICISM.

He said that the mountebank of the nineteenth century, with brazen face and clarion voice, travels the length and breadth of the land proclaiming himself as "Diamond Dick," "Indian Bill," "Big Chief," or by some other equally euphonious and ambiguous title as he asserts his skill and disposes of his wares. It might not be justifiable homicide to compel him to swallow his own darksome nostrums, but the present laws are insufficient for his repression and, however beside himself he may become, we can hardly hope that he will so far forget his villainy as to administer unto himself that which he so recklessly deals out to others.

To protect the public, the American Public Health Association should recommend the enactment of statutes excluding from the medical profession those who are not competent by learning, skill and experience to practice, and punishing by imprisonment any who violate the provisions. No one should be permitted to practice medicine or engage in surgery unless authorized to do so by a competent board of government or State examiners.

Dr. R. Harvey Reed, of Mansfield, Ohio, said it was no easy matter for the medical profession to eradicate quacks or *pretended* medical men. Whenever a question of this kind was brought before the legislature the profession had to contend with two prominent factors, viz., the quacks themselves, who furnished large quantities of money, and second, the general press of the country. Why the press? Because the quacks paid the newspapers more money for advertising than the regular medical profession, consequently the press aided the quacks in trying to down the law.

The next paper read was on

WATER SUPPLY AND PUBLIC HEALTH,

by Mr. Allen Hazen, of Lawrence, Mass., in which the author dwelt principally upon the typhoid fever and cholera germs which infect impure water. Typhoid fever and cholera bacteria are taken into the system through food and drink. Pure water is therefore a necessity. If water is absolutely free from sewage it can be depended upon as being comparatively pure, although many waters not polluted by sewage have been known to breed disease. Flowing streams will partially purify themselves. Reservoirs and long channels where water flows and becomes aerated will not always purify it. Some system of filtration is therefore imperative, and the question to be decided is the best means of filtration. Several systems were described but all were said to be more or less defective.

At the close of this paper, Dr. Henry B. Horlbeck, of Charleston, S. C., presented some vital

statistics from the Southern States, showing the death rate among the colored population to be much greater than that of the whites, and offered a resolution asking the governmental statisticians in preparing their reports, to arrange them so that this fact may be shown. No action was taken on the resolution.

EVENING SESSION.

At this session appropriate addresses were delivered by Gov. David R. Francis, of Missouri; Gov. L. U. Humphrey, of Kansas, and the Hon. John T. Peak, of Kansas City, Mo. Following these came the President's Address, by Dr. Frederick Montizambert, of Quebec.

He said to the medical men of Kansas City and its vicinity the meeting was meant in part as an appeal to quicken interest in the more purely preventive work of the profession, to increase interest in the organization and working of the coast quarantines and health boards by which people are affected; the sewerage of cities; the disposal of garbage and refuse; the purity of water supply; the infectious diseases of animals now known to be closely related to those of man, as well as other much broader questions of modern sanitation.

To the non medical of all ages, sexes and conditions it is an appeal to take a lively and an active part in the great crusade against dirt and disease. In the words of Sir Spencer Wells, "Instruct your mayor and corporation, your clergy, and your own household, that every case of typhoid fever, or scarlatina, of diphtheria or small-pox, of measles or whooping cough, can no longer be looked upon as natural and providential; but that the existence of such preventable diseases is a proof of ignorance and negligence and a disgrace to the country, to the town and the family."

Every one can do a little if only to make one home or one room bright, more cleanly and more wholesome. Sunlight, pure air, and thorough cleanliness are natural enemies to disease germs. These cannot live where they have not their proper food, which is found in dampness, darkness, mould and dirt. The experiments of Koch, Ransome and others prove that the living germs of consumption, when exposed to the sunlight, lose their vitality in a few hours, or even in a few minutes, if the layer in which they are exposed be thin enough, and that even ordinary daylight, if it last long enough, will have a similar effect. There is no sounder philosophy than the old saying that, "There is more health in a sunbeam than in drugs, more life in pure air than in a physician's skill, and that sunlight may fade your carpets, but better that than have its absence fade your cheeks."

The President then paid a tribute to the memory of such members of the Association as had

died since the last annual meeting. He then passed on and briefly reviewed the various contagious diseases as battled with by the health authorities of the country, together with the experiments entered into to overcome them. Asiatic cholera, la grippe, cancer and diphtheria were all touched upon, as well as disinfection and immunity.

SECOND DAY—MORNING SESSION.

Dr. Paul Paquin, of Battle Creek, Mich., read a paper on

VACCINE AND VACCINATION.

Dr. Paquin touched first upon the necessity for absolutely pure vaccine and told of some of the diseases that accrue from impure vaccine. The doctor had tested on rabbits, guinea pigs and fowls over 100 vaccine specimens. In these tests he said he had found such cheerful forms of bacteria as the bacillus pyogenes foetidus, the staphylococcus pyogenes aureus, the bacillus septicus, and gangrene micrococci. These he said produced abscesses, gangrenous lesions, septicaemia and pyaemia.

Dr. Charles N. Hewitt, of Red Wing, Minnesota, spoke of unfavorable results from using bad vaccine in his State and of the difficulty in obtaining good vaccine, and gave his personal experience. Small-pox, he said, is the same as it always was. An epidemic might sweep the country now as the country was practically unprotected.

Dr. Yesi, of Mexico, spoke of the compulsory vaccination of Mexico. Human vaccine alone was used. Lower animal vaccine is not cultivated. Better results from human than animal vaccine are obtained. A serious small-pox epidemic has not visited that country in about twenty-five years.

Dr. L. F. Solomon, of New Orleans, La., replied that in Louisiana each child must show a vaccination certificate before being allowed to attend school. About 90 per cent. of the primary vaccinations were successful. He favored the use of bovine virus.

Dr. Delos Fall, of Albion, Mich., read a paper on

THE DISPOSAL OF GARBAGE AND REFUSE.

He spoke of the intimate relation between typhoid fever and the accumulation of waste organic matter. The method used in New York is taking the waste out to sea and dumping it. Philadelphia recommended cremation. Chicago objected to the use of waste in filling holes and vacant lots and then building houses on them. San Francisco recommends cremation. Baltimore has dumps which are objectionable, and which will be removed as soon as a better method can be found. Cincinnati gives its waste to a desiccating company, which is under contract to

remove the same. In Charleston the city removes its own garbage; carts it out in the morning and generally gets through about noon. This waste is dumped into a salt water marsh. The cost is about \$19,000 a year. Milwaukee pays \$23,316 a year for collecting garbage by hand and \$15,000 a year for disposing of the same. The Merz system of disposal of the garbage is used. Garbage is at present disposed of by dumping it into Lake Michigan, much to the disgust of the citizens, because the Merz system contract has expired. In Washington the removal is carried on by the contract system.

Dr. Edward Clark, of Buffalo, New York, made a report on the collection and transportation of garbage and refuse in cities. He advised full police power for the sanitary service of large cities. A galvanized iron tank holding about two or three bushels is the best receptacle for holding household garbage. The refuse tank must not be placed on the street or sidewalk, but the collector should be compelled to go in and get it, remove the contents, and replace the cover.

For transporting, garbage carts are preferable for short, and wagons for long hauls. The beds should be made water-tight, and should be flushed after each dumping. Any driver who failed should be instantly discharged. The bed should be covered with iron.

EVENING SESSION.

The first paper was upon

RABIES,

by Dr. J. J. Kinyoun, of the U. S. Marine Hospital Corps. He said the disease was transmitted almost wholly by the canine and feline species. The disease prevails all over the world, except in Australia, where it is not known. He regretted that so little is known of its prevalence. He opposed the idea that the disease is confined to warm weather, the statistics showing that the greater number of cases occur in December and May. He discussed Pasteur's system and its success. Recognition of the disease is not easy in any animal in the early stages. He advocated the establishment and enforcement of strict quarantine regulations in order to eradicate the disease.

Dr. P. C. Remondino, of San Diego, Cal., read a paper on

AMERICAN CLIMATES AND THEIR PHYSICAL EFFECTS.

He said that it is well known that European immigrants soon lose their ruddy cheeks and bright eyes, with a certain loss of spirit, when they come to this country. They lived in happy disregard of all hygiene or science. In changing climate they followed no national rule whatever for the really necessary change of diet. He then ex-

tolled southern California, and compared it to the Garden of Eden.

A paper on the subject of

ANIMAL DISEASES

was read by Mr. Ernest L. Dundas, U. S. veterinary inspector at the Kansas City packing houses. He spoke strongly against the evil of diseased cattle being shipped to market. As soon as a farmer discovers that tuberculosis is about to ravage his cows, he immediately ships them off to market to get rid of them before they die on his hands. He recommended the police supervision of all milk dairies. He laid to the Jersey cow the blame of being most generally afflicted with tuberculosis.

Dr. Walter D. Green, of Buffalo, said that, while it might not be incorrect that the disease was quite common, and deserved close watching, still, the fact should only urge the physician to more earnestly fight against the spread of disease among his patients.

Dr. Peter Bryce, of Toronto, limited his remarks to tuberculosis in milk, and the manner in which the disease is most commonly transmitted to consumers. In Canada, he said, they never bred their milch cows, and in one city they never use a milch cow after she once goes dry; she is immediately sent to the butcher. The great question is how to tell a cow when she is so afflicted. It seemed to him that in view of the startling figures that there are 15,000,000 cows daily supplying the country with milk, and the fact that in certain abattoirs it has been shown that 5 to 10 per cent. of the cattle killed are tuberculous, there should be a most rigid and regular inspection of all milch cows, as is due the public.

NEW ORGANIZATION OF THE SUPREME BOARD OF HEALTH OF MEXICO

formed the theme of a paper submitted by Dr. Domingo Orvananos, of the City of Mexico. In this paper the outline of work covered by the Mexican Supreme Board of Health was given, showing a most complete system of supervision, a system which, on its face, would tend to make it one of the most thorough in operation in any country. One exceedingly good feature is the sending of a surgeon-physician with every ship leaving Mexican ports, who shall be held responsible for the sanitary condition of the vessel, and who shall be obliged to report to the Mexican consul at every port where the vessel may touch, and obtain from him a clean bill of health. This move was done in view of the fact that Mexico is preparing to meet the reciprocal treaties of all countries, thus calling for the service of an extensive maritime navy.

The session was brought to a close by a paper entitled

LAND HABITATION AS A PUBLIC HEALTH MEASURE,

read by Dr. George Homan, of St. Louis, Mo. The paper showed the benefits which would arise by the individual ownership of homes, as that would render less likely any communicable disease as well as render easier the fight against disease by admitting of isolation, a most desirable feature in combating disease.

THIRD DAY—MORNING SESSION.

Dr. Peter H. Bryce, of Toronto, read a paper entitled

THE PRESENT POSITION OF THE MILK SUPPLY PROBLEM FROM THE PUBLIC HEALTH STAND-POINT, AND SOME PRACTICAL METHODS FOR SECURING SAFE PUBLIC SUPPLIES.

Briefly, Dr. Bryce's summing up of the precautions necessary to healthy milk was thus:

1. It is especially desirable that a system of periodic veterinary inspection be exercised in addition to the dairyman's inspection.
2. Strong views should be held and exercised regarding the nature and quality of food for cows. All decomposed foods, as those which are liable to undergo fermentation, should be wholly avoided. The best foods are well ripened grains and grasses.
3. The stables of the cows are a point of great importance. Too often dark, damp, ill-ventilated and crowded pens have been the home of this chief of our food supplies. It is quite possible to keep even on a large scale a dairy stable free from the ordinary disagreeable stable odors. The water supply to the cows is of equal importance.
4. The care of the milk at the time of taking and subsequently is of all points at once the most difficult and the most necessary to supplying a wholesome milk. De Claux has said: "*Cleanliness is everywhere the *sine qua non*.*" This means almost a revolution amongst farmers and dairymen. The sterilizing of all cans and bottles by steam or dry heat and the boiling of all strainers will be necessary.
5. The delivery of milk is of prime importance.
6. When milk has reached the consumer it must be placed in a refrigerator or promptly consumed.

FOURTH DAY—MORNING SESSION.

Dr. J. Ramon Ycaza, of the City of Mexico, read a paper entitled "A Few Considerations upon the Progress of Public Hygiene."

Dr. Nezario Lomas, of Moreles, Mexico, followed with a paper entitled

NOTES ON THE HYGIENE OF RICE CULTURE.

Moreles is the great rice-producing State of Mexico, and the paper touched upon the sanitary effects of this culture. The vast rice swamps

were declared by the author to be most unsalubrious.

The report of the Committee on

CAR SANITATION

was read by Prof. W. W. Daniells, Chairman, Madison, Wis. He said the great difficulty in the heating arrangement of cars was that all systems thus devised are for heating alone, and that ventilation is not particularly sought.

Dr. R. Harvey Reed, of Mansfield, Ohio, said that if the public asked for these things, as it demanded fast trains and elegant car upholstery, it would get them.

Professor Daniells thought that cars should be made differently. Instead of covering Pullman cars with expensive tapestry they should be furnished with rattan or leather, as the cars on some of the suburban trains.

Dr. Joseph Sharp recommended comfortable air cushions that could be taken out and cleaned.

Dr. Charles N. Hewitt, of Minnesota, read a paper entitled "The existing methods of dealing with emigrants as respects infectious diseases in England and on English Ships, and the notification of infectious diseases among immigrants to the United States, the duty of the National Sanitary Authorities to the Sanitary Service of the States: an example of such an arrangement between the United States authorities and the State Board of Health of Minnesota."

Dr. A. N. Bell, of Brooklyn, followed with a paper on

"THE BATH AND ITS ADOPTION."

The Executive Committee reported to the Association two important resolutions. One was by Dr. Homan, of St. Louis, declaring it the sense of the Association that State and provincial inspection of the production of vaccine virus be established. The other resolution asks the establishment of a federal department of health, to have at its head a Secretary of Public Health—a Cabinet officer at Washington. Both resolutions passed.

Dr. Henry B. Baker, of Lansing, Mich., introduced a resolution to the effect that the Association hold its meeting in Chicago, in 1893, and that, so far as possible, the occasion be made an international congress of hygiene and public health, which was adopted.

The officers elected for 1892, are as follows:

President, Dr. Felix Formento, New Orleans, La.

Vice-Presidents, Drs. Walter Wyman, Washington, D. C., and Domingo Orvananos, of Mexico.

Secretary, Dr. Irving A. Watson, Concord, N. H.

Place of meeting, City of Mexico, date to be fixed by the officers of the Association.

Southern Surgical and Gynecological Association.

*Fourth Annual Meeting, held in Richmond, Va.,
November 10, 11 and 12, 1891.*

FIRST DAY—MORNING SESSION.

The Association convened in the hall of the Y. M. C. A., and was called to order by the President, Dr. L. S. McMurtry, of Louisville, Ky., at 10 A.M.

Prayer was offered by the Rev. D. M. Hoge.

The first paper read was by Dr. J. W. Long, of Randleman, N. C., entitled

ALBUMINURIA ; ITS RELATION TO SURGICAL OPERATIONS.

He drew the following conclusions:

1. That neither ether nor chloroform rarely ever injures healthy kidneys.
2. That when renal disturbances from the use of an anæsthetic, the kidneys being healthy, do occur, they are due rather to prolonged narcosis, exposure of the patient, or perhaps to the combined influences of the operation and the anæsthetic.
3. That a mild degree of albuminuria or nephritis, especially if recent, is not a contraindication to the use of chloroform or ether.
4. That even in the presence of advanced or extensive renal changes, an anæsthetic may be employed, provided the patient or family are advised of the additional risk.
5. That of the two anæsthetics usually employed, it is yet a mooted question as to which is the safer so far as the kidneys are concerned, unless it be in obstetrical operations.
6. That, while it is by no means the rule, profound functional disturbance, and even organic lesions, may be induced by an operation, apart from the influence of the anæsthetic.
7. That such renal changes are due to reflex sympathetic action or sepsis, or both.
8. That operations in certain regions, notably the abdominal, genito-urinary, about the mouth and rectum, are specially liable to produce renal complications.
9. That a healthy condition of the kidneys minimizes, but does not obviate, the dangers referred to.
10. That albuminuria is always indicative of renal lesions, and should be regarded with distrust, but is not a positive contraindication to an operation.
11. That when albuminuria is associated with other evidences of advanced renal changes, no operation should be undertaken without first candidly stating to the patient, or friends, the dangers incident to the condition of the kidneys.
12. That, paradoxical as it may seem, an operation will sometimes relieve an albuminuria due to acute affections.

13. That no surgeon is justified in undertaking an operation without first knowing the state of his patient's kidneys.

SYSTEMIC INFECTION FROM GONORRHOEA.

Dr. Bedford Brown, of Alexandria, Va., read a paper on this subject. He cited five interesting cases of systemic infection from gonorrhœa. He believes that there are two channels for the absorption and transmission of the gonorrhœal microbe into the general system. One is by continuity of surface over the mucous membrane of the genito-urinary tract from the urethra to the kidneys. The other channel is through the medium of the great lymphatic system, from the lymphatics of the urethra to the inguinal glands, thence through the lymphatics of the system into the general circulation. He believes also that this microbe, so transmitted, is lodged at different points in the organism. The gonorrhœal microbe transmitted by continuity of surface over the genito-urinary tract, invariably induces specific suppurative inflammation. On the contrary, when transmitted through the lymphatics, the inflammation is not of a suppurative character, but assumes peculiar types; then the contact of the infectious microbe with the mucous surfaces produces suppurative prostatitis, cystitis, ureteritis, pyelitis, and then, pyonephrosis. The absorption of the same through the lymphatic channels first sets up lymphangitis of the lymphatics of the urethra, then lymphadenitis of Cowper's glands, then of the inguinal glands, and inflammation of the connecting lymphatics. By further absorption it may induce septic phlebitis of the thigh, and finally synovitis, endocarditis, and internal destructive ophthalmitis. He also believes that, in certain cases, genuine septicæmia may be developed in the course of these complications. He thinks there is marked relative difference in the susceptibility of different constitutions to the systemic poisoning of gonorrhœal infection, as in other diseases. That the absorption and infection of the system from this cause is only in exceptional cases. The writer lays stress on gonorrhœal ureteritis following cystitis, as a part of the action of the gonorrhœal infection in its travels over the mucous surface of the genito-urinary organs towards its final destination in this direction, the kidneys. This complication is accompanied with pain, at times sharp and paroxysmal, usually dull and aching in character. These sharp paroxysms of pain extend upward to the kidney, and not downward toward the bladder, as in nephritic colic. Then again, there is soreness in the entire line of the ureter, increased on pressure, so that the course of the canal may be marked out clearly. Ureteritis is always established before nephritis begins in gonorrhœal infection.

The cases cited by Dr. Brown indicate that a

state of pyæmia or septicæmia may be developed by systemic infection from gonorrhœa in certain cases.

Dr. J. Edwin Michael, of Baltimore, Md., read a paper entitled

A REPORT OF SOME ADDITIONAL CASES OF EXTERNAL PERINEAL URETHROTOMY WITHOUT A GUIDE,

in which he said that the operation is one of great value both in gonorrhœal and traumatic cases, and he thinks one is justified in bringing forward any experience in it which may be of use to the profession. His results were very satisfactory, a fact which he attributed rather to the fortunate circumstance that his patients were largely free from grave constitutional disease, than to any method or application which he had to suggest. He had simply followed what he considered the precepts of good surgery as applied to this region of the body, viz.: free incision, free drainage, and as much of antiseptic surgery as the circumstances would allow.

The report of these eight cases brings up the number of patients on whom he made the operation of external perineal urethrotomy to seventeen, and the conditions which made the operation necessary include nearly all those which ordinarily indicate it. None of the patients have died at a period nearer than six months to the time of operation, and the deaths which have occurred were due to other causes. In the spring of 1887, he reported nine cases of perineal section without a guide, and he had only to add to the remarks made at that time, that increasing experience leads him to have more and more confidence in the good results of opening the perineum, and less fear of danger.

It is true that he had had unusual good fortune in operating on cases which, as a rule, presented no grave kidney lesion, but, while it must be admitted that such complication adds to the risk of the operation as much, if not more, than it does to others of equal gravity, he is firmly convinced that opening the perineum, in old stricture cases with bad kidneys, is much freer from danger than internal urethrotomy, or even dilatation. A case in point. About ten years ago he did an internal urethrotomy on a patient with an old, tough stricture. In forty-eight hours he had a temperature of 107°, and was very ill. The same patient returned to him a short time since. He could pass a No. 10 English sound with difficulty. The stricture was resilient, and closed after the sound to such an extent that urination was difficult and unsatisfactory. The patient had been having chills, and was somewhat nauseated and weak. His urine, although ammoniacal and ropy, contained no evidence of grave kidney trouble. He proposed a combined internal and external urethrotomy, and refused

to do either operation without the other. The patient consented. He opened the perineum freely, and cut the urethra with the Otis instrument to 40 F. The temperature did not rise above 100°; the patient did well in every particular, and in three weeks he sent him home, passing a No. 36 F. instrument on himself.

FIRST DAY—AFTERNOON SESSION.

Dr. W. F. Westmoreland, of Atlanta, Ga., read a paper entitled

REDUCTION OF DISLOCATIONS BY MANIPULATION.

Dr. Joseph Price, of Philadelphia, Pa., followed with a paper on

COMPLICATIONS IN PELVIC SURGERY, AND HOW TO DEAL WITH THEM.

The author's reasons for choosing this subject were that the importance of recognizing the part that complications play in the work of the surgeon are not appreciated by the generality of medical men, by general surgeons, and, least of all, by the tyro in surgery, and by those who are anxious to begin their surgical investigations and trial trips by an entrance into the domain of abdominal or pelvic surgery. The complications in this special branch of surgery are primarily those of surgery in general, with many things superadded to render them formidable. It may be the intention of the surgeon to remove the appendages for a bleeding fibroid. In ordinary operations the removal of the uterine appendages is to the skilled abdominal or pelvic surgeon one of the simplest of undertakings. If, however, he attempts to accomplish their removal without holding in mind the complications that as a rule exist, or if he is a neophyte or an experimental dabbler, he will find too late, in many cases, that he has attempted an operation that he cannot finish, or if he does complete it, he has also sacrificed his patient, or rendered her worse off than before. In other words, to accomplish a cure, must abandon removal of the appendages, and perform hysterectomy, which has but little in common with the operation originally proposed. If this idea is still further carried out, we shall find that complications do not confine themselves to one system of organs, but extend to all surrounding structures, by reason of inflammatory adhesions. This is true of the bladder, ureters, intestines, omentum, stomach, and liver. Adhesions are the bane of abdominal and pelvic surgery, and hence we see that the greatest mistakes and failures are made by those who, from a knowledge of abdominal surgery simply have attempted to deal with pelvic inflammations. The abdominal surgeons who can be counted as really successful pelvic surgeons are, therefore, few. This is said with no intention of detracting from the importance of abdominal surgery. The

strictly abdominal organs must always enter largely into the domain of surgery.

With regard to irrigation, we must get out of our heads the idea that it is dangerous. Too often in the writer's experience has hot water brought about a speedy reaction in patients whose lives were almost despaired of. We are told that cases do not need flushing, that they do badly under it. Dr. Price believes that they do need flushing if they are desperate cases, and if they do badly, they do so not on account of the flushing, but because of the operation that preceded it. Next, we have a resort in packing. Gauze packing accurately applied to the bleeding or oozing surfaces, so that it can be removed without interfering with the otherwise completed operation, is of infinite value in hæmorrhage. It can be suffered to remain indefinitely almost, broadly speaking—at least, up to sixty or seventy hours, if absolutely clean and fresh, either salicylated or iodoformized. The drainage tube controls hæmorrhage. The drainage tube is currently spoken of as if it were an annex to pelvic surgery, easily dispensed with. The writer uses it almost without exception in adhesions. His results are better than those obtained without its use.

The plea of the paper was for absolutely exact, painstaking work, that shall leave nothing for regret, nothing to do over, nothing to explain, but shall stand out in the light of results as justifiable, scientific and perfect, when put beside methods that palliate without curing, and are no more a part of real surgery than is hypnotism refreshing sleep.

LAPAROTOMIES PERFORMED DURING THE PAST YEAR.

This was the title of a paper read by Dr. Thos. Opie, of Baltimore, Md.

The tabulated statement accompanying the paper embraced thirty-two abdominal sections made in the twelve months, beginning November 1, 1890, and ending October 31, 1891. The operations were performed consecutively as follows: Ovarian tumors, 6; chronic ovaritis, 7; fibroid tumors, 4; pyosalpinx, 5; retroflexion, with adhesions and dysmenorrhœa, 3; exploratory incisions, 3; extra-uterine pregnancy, 1; abscess of ovary, 1; cyst of broad ligament, 1; cystic degeneration of ovary, 1.

Nine of these patients were operated on in the amphitheater before the whole class at the College of Physicians and Surgeons, the remainder, twenty-three, were operated on privately. Twenty-seven were white, and five were colored. The deaths were as follows: Oöphorectomy for pyosalpinx, 1; shock from ovariectomy, 1; oöphorectomy for acute mania, 1; and abdominal hysterectomy for fibro-cystic tumor, 1. Total, 4.

Stitch Abscess.—This complication occurred

nine times, a much larger number relatively than he had seen recorded heretofore. While no case proved disastrous, several were exceedingly annoying in delaying patients in hospital. They occur most frequently in cases where the drainage tube has been used. The early opening of abdominal dressings for any purpose favors their occurrence. When the dressings remained intact for seven days there seemed to be the greatest immunity from the stitch abscess.

Drainage was resorted to in but three cases during the year. Case 2, ovarian and dermoid cyst, had a drainage tube in five or six days, and the writer is convinced that it retarded the patient's convalescence. He is of the opinion that too much flushing is done; that it is but seldom called for. A plentiful supply of fine, properly prepared elephant-ear sponges will do away with flushing in most cases, and remove the necessity for drainage. They are efficient helps in keeping the abdomen free from infection.

(To be concluded.)

American Electro-Therapeutic Association.

The first congress of the American Electro-therapeutic Association, was held at Philadelphia, September, 24th, 1891, with the following officers:

President, G. Betton Massey, M.D., Philadelphia.

Vice-Presidents, William James Morton, M. D., Augustin H. Goelet, M.D., New York.

Secretary, William H. Walling, M.D., Philadelphia.

Treasurer, George H. Rohé, M.D., Baltimore.

Executive Council, Horatio R. Bigelow, M. D., Philadelphia; Franklin H. Martin, M.D., Chicago; William F. Hutchinson, M.D., Providence; Frederick Peterson, M.D., New York.

The first annual meeting of the American Electro-therapeutic Association was held in the College of Physicians, corner 13th and Locust streets, Philadelphia, September 24, 25, and 26, 1891.

The first session was called to order Thursday, September 24th, 3 P.M., with President Massey in the chair. After the meeting came to order, G. Betton Massey, M.D., Instructor in Electro-gynecology in the Philadelphia Polyclinic; Physician to the Howard Hospital; to the Dispensary for Women, etc., delivered an address on

A PLEA FOR THE ASSOCIATED CULTIVATION OF SPECIAL EXPERTNESS IN MEDICINE.

Gentlemen:—It is with much pleasure that I pronounce the American Electro-therapeutic Association an accomplished fact. Organized amidst many expressions of doubt on the part of occasional workers in electro-therapeutics, it has already met with a reception which ensures for it a

career of active usefulness in the near future, and has enrolled a membership with which it is an honor to be associated. It is of this infant organization that I wish to speak to you, of its reason for being and of its responsibilities, as an illustration of an important means of advancing the sum of human happiness by exalting the skill of practical workers in a certain field of medicine.

Among the special societies of the day none occupy the peculiar position of an electro-therapeutic association. None other is devoted to the study of a single therapeutic agent or has a membership embracing workers in so considerable a number of specialties. Narrow in one sense, it is in another sense nearly as broad as medicine itself, since there are but few departments of medical work unrepresented in our present programme.

But such an Association as this differs in a more important particular from other special societies. While composed like them of students of a certain subject, the members of this association are not exclusively devoted to the questions to be considered here. They are rather a company of special workers in diverse departments seeking greater expertness in the administration of a certain therapeutic force. That the progress of the healing art as a whole has made it incumbent on certain of its practitioners to devote special study to this one therapeutic force is a sign that medical art is partaking fully in the general advance of science, which demands the services of experts in every field. At the very inception of this association I therefore wish to lay stress upon a proper idea of its reason for existence. Let no one suppose that we are here to uphold or study any exclusive system of treating disease. We are here merely as experts and students desiring greater knowledge of a favorite art, and I trust that you will debar from membership any person who does not give adherence to medical knowledge as a whole, and make proper use of any and all agencies of value in the cure of the sick.

A necessity of the times, as evidenced in recent changes in medical education, is the enforcement of a broader culture among physicians. There is no doubt that this will tend to increase the membership of special scientific associations, but it must not be forgotten that these organizations themselves arise in a more peremptory assertion of the natural law of supply and demand. There is always a vast difference between the merely cultured man and the expert; the one delights us, but to the other we turn for the advancement of human knowledge and for real help in the crises of life. As the community increases in intelligence, this seeking after experts will doubtless become more pronounced in all departments of human service of man to man above the me-

chanical work of the common laborer, and we may well conclude that the healing art will partake fully in the benefits of this natural selection. A demand for experts creates a demand for expert training, an educational thoroughness that is well known to be impossible in our medical colleges at present. To meet this emergency there has fortunately grown up of late two agencies: the one, the post-graduate college, to teach ordinary skill; the other, the special society, which bears to yet unconquered disease the relation of a well-disciplined army to the borders of a hostile and unexplored country. Thoughtless men neglect both, but the wise see in such agencies the means of advancing personal knowledge of the practical needs of their work. It is to be hoped that their establishment will quicken an evolutionary process in our profession that will finally develop it into an ideal organization of skilled interdependent workers; where each member, profoundly cultured in the universal sciences of medicine, will yet confine his work to that branch in which he is skilled. Such a specialism in parts and members is nature's ever present pattern for our admonition and imitation. When such a time has arrived, the fortunate objects of our professional care will receive that highest skill to which they are in justice entitled, and which they rarely receive at the present moment.

In this hoped for Utopia of professional conscientiousness, skilfulness and modesty, I am sure it will be impossible to duplicate the position of a recent correspondent, whose apparently careful and exhaustive article on the electrical treatment of uterine fibroids in a recent journal led me to request him to discuss the subject at this meeting. He replied that he knew almost nothing about electro-therapeutics, a fact that I had already suspected. So remarkable an admission of ignorance from a person assuming the position of trying and judging causes one to wonder if he had been equally frank with the thirty or forty patients mentioned in the paper before undertaking their treatment. Well might we beg a modern addition to the ancient Hippocratic oath in which the medical men swore not to "cut for stone;" an addition that would compel the non-expert to forever refrain from assuming responsibilities for which his training has been insufficient, and that would have rendered impossible that recent crop of jacks-of-all-trades who have "tried electricity." Of all the enemies of scientific research in electro-therapeutics these are the worst. Not even the pure quacks do the harm of these Pharisees, who blunderingly attempt to use a remedy in private when their patients demand it, and publicly condemn it on the strength of such evidence. These mistaken attempts at medical omnipotence should be frowned upon as savoring of a crime toward both the patient and the remedy.

The organization of a national electro-therapeutic association crowns the full emancipation of this remedy from the thralldom of quackery. Neglected by the profession in the years that elapsed between the memorable medical experiments of Franklin in this city and the discovery of the dynamo, the marvelous triumphs of electrical engineers have at last aroused medical men to the need of discarding ideas, methods and appliances that preceded the electrical new-world discovered some fifteen years ago. The assumption of new methods in electro-therapy has been extremely slow as compared with the industrial revolution which has already altered the face of civilized communities, but it is to be hoped that this body will be a powerful stimulus to the spread of scientific work in America.

Science is, however, but another name for truth, and in touching upon the objects of an association for the study of a force so well harnessed by natural law as electricity, it is evident that truth must ever be held as paramount in our discussions. Armed with laws that unlock the hidden power of this force over certain diseases, we are also equipped to demonstrate its utter uselessness in others by the application of an agnosticism that refuses to believe anything unless proven. But in clearing away the rubbish of unproven statements that make up so much of our archaic electro-therapeutic literature, we will by no means weed out the entire field of so-called medical empiricism. It is not alone in electro-therapy that the careless dicta of professional book writers has told us that such and such an agent is good for such and such a disease, without specifying the conditions that are necessary to save us from failure in actual practice. Read any classical work on general therapeutics that is ten years old, and see the blind empiricism from which all therapeutics have been evolved. There should be no nobler work for this Association than sifting the ancient claims for electricity, particularly in certain diseases of the nervous system, and establishing either their falsity or the conditions under which they are true. All remedial agencies are environed with limitations which vary with the dose used, the condition of the patient, etc., and this is particularly true of the one under consideration, which may in turn be a calmant, a stimulant, an absorbent, a solvent and a destructive agent. Here a hundred possible variations must be scanned to get the possible road to success, and hence this society is an eminently technical one. The broad question of the value of electricity in a certain disease should be subordinated here to exact data of the kind of current used, the dose, the duration and frequency of treatment, and the nature and position of the electrodes. All these should be specified before a claim is made that this agent is worthless in a given disease, since

a different combination of the same factors and conditions might have led to success. Similarly, the conditions giving rise to the successful treatment of a disease that should be specified with equal minuteness in order that others may find it possible to verify and duplicate our results.

It is for such work that the American Electro-therapeutic Association is needed, and badly needed. I do not decry the presentation of electrical papers to our various general and special societies, but it is in the nature of such presentations that they must assume the polemical attitude of enthusiastic endorsement or wholesale condemnation of general facts—must deal in glittering generalities—to be other than tedious to their audiences. Such papers do little to advance our knowledge of a special subject, and the speakers upon them are rarely capable of intelligently discussing the whys and wherefores of success and failure that I trust you will bring into prominence at these meetings.

Among the questions that demand this critical investigation, may be mentioned the whole subject of the use of electricity in organic nervous diseases and in the neuroses. We are here handicapped, of course, by a still imperfect knowledge of many pathological conditions underlying these diseases, yet I think it is even now possible to make a broad division of the electro-therapeutics of nervous diseases into two groups, the one acting by transferred physiological processes through the agency of the spinal and sympathetic systems, and the other acting by virtue of a direct passage of lines of flow through, or by a polarization of, the primary or secondary seats of the disease. The indirect method is, unfortunately, the most common, since we are restricted to it frequently by the deep situations of the diseased areas, and in its various applications we are limited in progress by the limitations of these physiological carriers of our remedy. We are here in much the same position as in prescribing drugs, whose action is generally limited by the circuitous routes of absorption and circulation. It is doubtless in the method of direct action that electricity will yet make its greatest advances in the treatment of nervous diseases; a method which involves the possibility of concentrating a sufficient density of lines of force through a diseased area to accomplish an alteration in its nutritive condition. This is yet an almost virgin field in neurology, depending somewhat upon improved methods of conducting efficient currents through the dermic surface, and in estimating the possible future value of strong currents thus scientifically conducted to the actual seats of disease, I can conceive of but one organic basis of disease as absolutely and at all times unpromising and resistant, namely: that due to living germs.

Of the work before you in considering the value of electricity in gynecology, I need not

speak at length. This is regarded as a most important question in every gynecological society in the world, and while we are fully justified in considering its relative value as compared with other means, we will have a greater opportunity to discuss the many technical questions that belong to the subject. Here, indeed, is material for a society alone. The exact methods used by men of large experience in the various diseases of women are living questions that come home with force to any one who essays this work. Such things are rarely well shown in books, because of the changing extent of our yet imperfect knowledge. Owing to the many possibilities of direct treatment in gynecology, we have nevertheless already accumulated a most respectable series of exact therapeutic facts, with many useful rules deducible from them, and in the great activity now characterizing this branch of electro-therapeutics, an almost daily advance in our knowledge is inevitable. It is in this department of diseases of women, that electricity as a remedy has encountered its first real and bitter opposition from non-users in the profession, but we should remember that here its greatest value as a curative agent is becoming conspicuous, for "the blood of the martyrs is the seed of the faith." To its good work of restoring health and function by combating diseased processes, has been added the labor of combating unwise surgery, that, in a laudable effort to perfect a useful technique, has sacrificed thousands of patients and parts of patients on the altar of harsh experiment.

Among other branches of the work, great interest attaches also to the electro-therapeutics of visceral and circulatory diseases, of dermatology, of strictured canals and orifices, and of the nasopharynx. Each of these questions will be infinitely better understood when discussed by experts, and cannot fail to be placed on a higher plane of scientific exactitude by each one of our annual gatherings.

As important accessories to these advancements in our ability to cure and control disease, certain questions of detail common to all this work demand our attention. This Association should take action on the important matter of securing a uniform and reliable calibration of our milli-ampère meters. Many of the instruments supplied to the profession are improperly graduated, and others soon fail to read correctly through imperfect construction. This is surely a matter of greater importance than the correctness of the scales used in trade, over which the State wisely maintains a supervision. In the absence of Government assistance in verifying our instruments, some practicable substitute should be devised. Our Faradic batteries are also yet far from perfect, besides being devoid of intelligent means of graduation, and I trust that you will take early

steps to bring this somewhat old-fashioned instrument up to the high character demanded by modern work.

Such, in briefest language, are some of the reasons why special workers should meet in occasional conclave. To the unfortunate sufferers from the affections coming under our care, this meeting is fraught with high consequences. Unless we can go back to them with an added power over disease, our coming here is bereft of its highest value, for in the presence of human suffering, we can recognize utility alone as our measure of results.

Dr. Bigelow, Philadelphia: I think some resolution should be made on the President's able address, and I move that a committee be appointed to take action thereon and report at our opening session to-morrow, and that the President be requested to appoint three gentlemen for that purpose.

Motion seconded and carried, and Drs. Bigelow, Goelet and Morton appointed.

(To be continued.)

STITES' TEST FOR CARCINOMA.—On October 17th, at the surgical clinic, I removed for atrophic scirrhus the right breast of a female, aged sixty-one. In the presence of the class the tumor was immediately subjected by Dr. W. M. L. Coplin to the test of Mr. H. J. Stites, of Edinburgh. The method of examination was that furnished me by Professor Chiene, of Edinburgh, which I give in his own words:

1. Excise the mamma.
2. Wash thoroughly in water to remove blood.
3. Place in a 5 per cent. solution of nitric acid (B. P.) for ten minutes.

4. Wash in cold water for five minutes.

By the time these procedures are executed the axilla is cleaned out and the vessels tied. The mamma is now examined; the carcinomatous structure appears a dull white, like the eye of a boiled fish, the healthy tissue translucent. When any such reaction is seen additional tissue should be removed at the corresponding point.

In removing the carcinomatous breast, Professor Chiene directs that its relations to the circumferential tissues should be marked by the knife, so that after the test has been applied to the mass excised the situation of any outlying, unremoved diseased areas can be fixed.

In the case operated upon the foregoing directions were carefully followed by Dr. Coplin, who demonstrated to the class that the infected tissue became of the characteristic "dull white," resembling egg-albumen, while the uninfected tissue appeared translucent and gelatinoid, affording a striking contrast to the carcinomatous structures. The reaction in the axillary glands seemed even more marked than that in the breast; it therefore would, perhaps, be well always to retain one gland for comparison with those treated with the acid.

The test described by the distinguished Scottish surgeon as devised by his assistant, Mr. Stites, appears to be a most perfect one. It is to be hoped that future trial will show that it can be depended upon, and that it can really be accepted as a gauge of the thoroughness and sufficiency of removal of carcinomata, not only of the mamma, but also of other parts.—John H. Brinton, M.D., in *Med. News*.

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This is obtainable, at any time, by a member of any State or local Medical Society which is entitled to send delegates to the Association. All that is necessary is for the applicant to write to the Treasurer of the Association, Dr. Richard J. Dunglison, Lock Box 1274, Philadelphia, Pa., sending him a certificate or statement that he is in good standing in his own Society, signed by the President and Secretary of said Society, with five dollars for annual dues. Attendance as a delegate at an annual meeting of the Association is not necessary to obtain membership. On receipt of the above amount the weekly JOURNAL of the Association will be forwarded regularly.

SATURDAY, NOVEMBER 28, 1891.

DIET IN FEVER.

The dietetic management of the febrile state is always a matter of interest, and an extract in *L'Union Médicale* from a work by MAUQUAT, soon to appear, covers the ground so logically that we have thought it desirable to review it for the benefit of our readers.

During an acute fever, the appetite is usually diminished; the mouth is dry from the diminished salivary secretion, and this latter feature is an index to the secretions generally throughout the alimentary tract. In the stomach the gastric juice is secreted not only in diminished quantity, but is changed in quality, the hydrochloric acid being much reduced. The frequent craving of febrile patients for acids is thus explained, and although we do not have to resort to the means of the wise old doctor who, before the days of the clinical thermometer, found that a child was feverish by asking which it would have, an orange or some candy, and finding that it preferred the orange—still the lesson is not useless to-day. The pepsin, on the other hand, is not diminished, at least, enough is always present to carry on the functions of gastric digestion if the acid be supplied. In the duodenum it is found that the pancreatic and biliary secretions are diminished, and that the digestion of fats is thereby rendered nearly negative. In addition, the absorptive func-

tions of the alimentary canal are decidedly below normal.

The febrile state results in the production of an increased amount of tissue change, with corresponding increase of poisonous waste products, while the exciting cause of the fever also adds to the poisons elaborated and calling for elimination. In typhoid fever, the blood contains 7 to 9 per cent. of extractives, while normally it should contain 4 per cent., according to ROBIN.

A low diet protects the impaired digestive tract, is a powerful means of lowering temperature, favors absorption of liquid from the tissues, thus relieving congestion, and prevents the admission to the circulation of alimentary poisons; but, on the other hand, it prevents tissue repair, and allows the body to waste. It therefore becomes a cause of weakness, and prolongs convalescence.

Food capable of proper digestion and assimilation prevents an excessive bodily wasting, and furnishes strength to the patient to combat the disease, but overfeeding is disastrous. It introduces into the alimentary canal material which can be neither digested nor absorbed, and which acts as a foreign body, exciting at times vomiting and diarrhœa. It frequently causes an elevation of temperature and an increase in the pulse rate, favors a tendency to exudations, and in the case of albuminous food, often gives rise to poisons which, when absorbed, either produce symptoms or increase the burdens of the emunctories.

Proper feeding in fevers may therefore be said to consist in giving to the patient such articles of food as can be digested and absorbed, in quantities that can be completely managed by the digestive agencies, avoiding substances which, for mechanical or chemical reasons, might be contra-indicated. Take the medium view advocated by Hippocrates, who observed that it was as bad to feed too little as to feed too much.

Eggs as a food in fever are distinctly contra-indicated. No class of albuminous foods requires so much hydrochloric acid for digestion, and this is the element of the gastric juice which is wanting. The use of this acid after feeding seems insufficient. Meats fall into the same category, and are hardly ever available as foods unless administered in small quantities, very finely subdivided. The diminished motility of the stomach, which favors the retention in that

organ of food, directly favors the decomposition of meat.

Various views have been held regarding milk. G. SÉE says that it is badly digested, and DUJARDIN-BEAUMETZ believes that its principle utility is to be found in the water and salts which it contains. It is, nevertheless, a food which is generally relished, and which certainly is most useful in fevers. If hydrochloric acid be administered with it, there can be but little doubt that it is fully digested.

Bouillon is often decried because of its lack of nutritive value. As ordinarily made, it does not contain much albumin, but it is rich in salts. According to A. ROBIN, there is in typhoid fever a true mineral inanition, and he regards bouillon as an excellent means of supplying the deficiency.

It is more than improbable that the organism can utilize mineral water brought to it in this shape, and it seems certain that these very salts hinder the antitoxic action of the liver. Beef tea should therefore rather be regarded as a palatable means of administering water. Although gelatine alone is of but slight nutritive value, yet it is usually agreeable to the fever patient, and when administered with some form of albuminous food, its nutritive value is markedly increased. Starches are well digested by fever patients, and, together with sugars, should constitute an important part of their diet. These latter substances are best administered in drinks. Drinks, particularly of pure water, lemonade, diluted wine, aerated waters, rice and barley water, are of the greatest value to these patients. Fats should not be given, because of the failure of the pancreatic juice. Cream, however, is an exception, and, as found in milk, is well borne. This outline may serve well as a general guide for feeding in fevers, always to be modified by the particular conditions present in any special febrile process.

THE AMBULANCE SERVICE OF GENERAL
HOSPITALS IN CITIES: "THE LITTLE
WARD ON WHEELS."

One of the modern improvements of hospitals is the ambulance—inclusive of the bright young surgeon. If we mistake not, twenty years ago there were not in the country more hospital wagons than could be counted on the fingers of one hand, while

now there are in some cities eight or ten thoroughly equipped vehicles. The last report of the superintendent of the Johns Hopkins Hospital alludes to the want, felt at that institution and in the city of Baltimore, of some adequate means of transit for its patients. DR. HURD writes as follows: "An ambulance is desirable and would serve a most useful purpose. There is at present no ambulance system in Baltimore and accident cases and cases of severe disease are forced to rely upon the police patrol wagon, which does not furnish any adequate shelter from the sun or storm, or good facilities for the transportation of the sick and wounded. The excellent ambulance service which exists in New York should be adopted in this city. Many applications are made for the services of such a vehicle, and it is to be regretted that the hospital does not possess one."

In nearly all our cities where any two institutions come into friendly competition for surgical and police practice the ambulance becomes an absolute necessity, otherwise the institution that is most centrally located will outstrip the others, if the latter do not take steps to provide the "little ward on wheels." And further, when two such conveyances come into competition, it is most interesting to observe how the service brightens up, and picks up new points and appliances—all of which redound to the better care of the sick and wounded. Of the character of the young ambulance surgeon in a certain city of our acquaintance—where the appointments are made as the outcome of competitive examination—we cannot forbear to quote the opinion of a judge, of high repute in criminal and violent cases, that these young men are almost always good witnesses, intelligent, clear-headed and courteous, and make a deep impression upon the jury as well as on the jurists. The public or court duties of the meritorious surgeon has, in this way, proved a useful introduction to valuable connections. Ordinarily there is a warm enthusiasm and *esprit de corps* on the part of the surgeons which serves the patient's interests during many a critical moment, besides yielding a various and vivid experience very different from that which awaits the budding practitioner who has no public functions or advantages. In some cases the ambulance surgeon is the "junior house" and is required to give six months to the ward-work of his hospital be-

fore he goes out on the wagon to act upon his own responsibility—a rule which has been found to shield the young surgeon against allegations of “total inexperience” and the like. In some of our cities, the volume of business performed by the ambulance service will exceed an average of a thousand cases per annum to each wagon, or over three calls per diem. In the case of a large conflagration or other great casualty, a great amount of labor falls on the ambulances; and they become the means of relieving a great deal of suffering and of preventing much injurious delay. Unauthorized demands upon the service, or “fake calls” as they are sometimes termed, are a detriment to its earlier periods. They tend to diminish, however, as the service matures, especially if harmonious relations with the police are maintained and if an efficient signal system is supplied.

The question of the annual cost of an ambulance is an important one to all hospital authorities who are canvassing the subject of its introduction. The cost of the original plant may vary greatly in different localities, for some institutions are so constructed as to have no space to spare for ambulance purposes, while others can be adapted thereto quite inexpensively. From some inquiries recently made, we judge that the average outlay for a plant, made *de novo*, may be stated at one thousand dollars, while the running expenses per month need not exceed one hundred dollars per month during the first year. This pre-supposes that no salary is paid to the house-surgeon who acts as ambulance surgeon. It would be a better plan to increase that monthly amount by thirty or forty dollars, to be set aside as a partial recognition or *vourccur* to the young surgeon. The hospital should supply uniforms to all who appear in public in connection with the ambulance. Numerous considerations—nearly all of them referable to the public good—make this step advisable, although the expense account is materially increased thereby. In conclusion, the American system of hospital ambulances, as the foreign journals generally designate the system, as it has gradually grown up in this country, may now be seen in some European cities, and so far as we have heard, no hospital, either abroad or at home, that has once undertaken this line of service, has ever been content to be deprived of it. The ambulance is, in its

essence and development, a humane and life-saving institution, almost as much so as the hospital itself; it is a kind of wheeled extension of the examination ward. It is in fact permissible to call it “the little ward on wheels.”

ACTING ASSISTANT SURGEON U. S. A.

We are in receipt of an attractive little volume, having a title as “Records of the Association of Acting Assistant Surgeons U. S. A.,” which gives an insight into the reasons for such an organization, with a brief sketch of those who are at present identified with it.

The purposes of the Society are mainly to work for a proper recognition of the corps, on the part of the government.

In the first place, it was very unfortunate that the title of *Acting Assistant Surgeon* was given this corps, as the name carries with it a feeling that it is applied to a substitute, and substitutes among the soldiers during the war were odious and not held in high estimation by any one. These Acting Assistant Surgeons should have been given an actual rank, as they were called upon to perform all the varied services of a commissioned officer, and we are ready to bear testimony to the efficiency, professional skill, and arduous labors of a goodly number of these physicians who were in the service during the late war.

Inasmuch as the government finds it necessary to continue the service of fifty Acting Assistant Surgeons, justice demands that the offensive title of *Acting* should be dropped and that of Assistant Surgeon of the second grade established. The officers of the grade to rank as Second Lieutenant, and where the officer is below the proper age, he should be allowed the privilege of examination for promotion.

In this connection we suggest to the officers of the government in both the Army, Navy and Marine-Hospital Service, the eminent propriety of holding examinations at stated intervals in all the principal cities of the Nation. This would have a most favorable influence in popularizing the government service. We believe the Navy is always short of medical officers, and perhaps this may be said of the other departments. The convening of a board of examiners in Chicago, Detroit, Cincinnati, Louisville, St. Louis or New

Orleans would have a good effect upon the National service and also upon the medical profession in those cities and the country tributary to them.

The Surgeon-General of the Army and Secretary of War are loudly called upon to take such action as may be necessary to bring about needed improvement in the rank and title of those who are recognized as honorable men and skillful medical officers, but who are serving our country under an unjust and odious designation.

STITES' SURGICAL CRITERION FOR CANCER.

DR. JOHN H. BRINTON has put into practice at his surgical clinic at the Jefferson Medical College a new test for cancer, proposed by MR. H. J. STITES, of Edinburgh. The method, as given by DR. BRINTON, in the *Medical News*, October 31, is that which was furnished him by DR. JOHN CHIENE, of the Royal Infirmary of Edinburgh, and reads as follows:

1. Excise the mamma.
2. Wash thoroughly in water to remove blood.
3. Place in a 5 per cent. solution of nitric acid (B. P.) for ten minutes.
4. Wash in cold water for five minutes.

By the time these procedures are executed the axilla is cleaned out and the vessels tied. The mamma is now examined; the carcinomatous structure appears a dull white, like the eye of a boiled fish, the healthy tissue translucent. When any such reaction is seen additional tissue should be removed at the corresponding point.

In removing the carcinomatous breast, PROFESSOR CHIENE directs that its relations to the circumferential tissues should be marked by the knife, so that after the test has been applied to the mass excised the situation of any outlying, unremoved diseased areas can be fixed."

The above description, although applied in this instance specifically to mammary cancer, need not be limited to that affection, but may be used for other diseased glandular structures. DR. BRINTON's case, operated upon October 17, was, however, a mammary cancer, and the demonstration of the test before the class was made by DR. W. M. COPLIN, while the surgeon proceeded with the removal of the diseased structures. The reaction in regard to the infected axillary glands was more distinctly noted than in the breast tissues; it would, therefore, be proper always to retain one of the excised glands, without the treatment by the acid, for purposes of comparison. This procedure or test devised by MR.

STITES, who is spoken of as an assistant of the distinguished Scottish professor of surgery, "appears to be a most perfect one," as DR. BRINTON says. It is worthy of careful trial in order to ascertain if it can be relied upon under differing conditions as regards the sight and nature of the malignant growth. It will be no small gain to surgery if this test can really be accepted as a criterion or gauge of the thoroughness and sufficiency of the operative steps for the ablation of cancerous masses, not only of the mamma, but also of other parts.

DOMESTIC CORRESPONDENCE.

Deming (N. M.) as a Health Resort.

As regards Deming for a health resort for people coming from the East, affected with pulmonary or bronchial troubles, we would say:

Deming is situated on a plain, surrounded by mountains, comprising an area of about 50 miles square. This is at an elevation of about 4,500 feet above the level of the sea. The temperature on this plain is always mild, never going below the freezing point in day time during mid-winter, while the heat during the summer never becomes extreme. The rainfall is exceedingly slight, limited principally to the months of July, August and September, while the air during the rest of the year is comparatively free from moisture.

The water-supply is received from the Black Range, which is a spur of the Rocky Mountains. The water is the purest in the territory, being filtered through a stratum of sand for a distance of 25 miles before reaching town; thereby freeing it from all impurities, before it is used.

With these facts in view, we would state as follows: All patients affected with pulmonary tuberculosis coming from the East to this country, before the disease has progressed too far, who will take the proper amount of exercise in the open air, live on a healthy diet, have nine chances out of ten for their ultimate recovery, as proven by personal experience during nine years of practice in this part of the territory.

Patients affected with chronic bronchitis find it advisable to remain from July to January or February, when the winds commence to blow, experience having proven, that during that time of the year they make the most rapid and satisfactory progress; but even in the windy season seldom have really obstinate cases of bronchial troubles come under my observation.

With the railroad facilities, which this place enjoys, the pure, dry atmosphere, the unusually good water, the equable climate, which permits people to stay out of their dwelling at all hours of the day the year round, we would recommend Deming most highly as a suitable point for establishing a health resort.

J. W. WILLIAMS, M.D.

Deming, New Mexico.

THE *Sanitary Record*, of London, owing to the financial difficulties of Messrs. W. H. Allen & Co., the publishers, has passed into other hands, and is no longer edited by Miss Hart.

BOOK REVIEWS.

MEDICAL COMMUNICATIONS OF THE MASSACHUSETTS MEDICAL SOCIETY. Part II of Volume XV. 1891. Boston: David Clapp & Son.

This is a notable issue of a long and valuable series. Very few pages are allowed to run to weeds in these "Communications." We desire, in the first place, briefly to draw attention to the paper entitled the Shattuck Lecture, by Dr. Edward Cowles, of Somerville. Its subject is "Neurasthenia and its Mental Symptoms." This essay is a long one, comprising, as it does, over a hundred closely printed pages, but it is none too long, as being the best résumé of the subject that has appeared in ten years. Dr. Cowles is the medical superintendent of the McLean Asylum, or branch for the insane of the Massachusetts General Hospital, and appropriately addresses himself to some of the parallel workings of pathological fatigue and certain of the forms of insanity which have their etiology in common, namely, in nervous enfeeblement. The fundamental idea of the writer is that there is a moderate auto-intoxication even in normal fatigue, from or after the discharge of energy, by the toxic products of exercise, always formed in both nervous and muscular structures. These toxic elements tend to accumulate in the blood and tissues of the neurasthenic patient, and manifest their ill-effects by a local or general inanition and auto-intoxication greater in degree than that which marks the advent of a temporary and repairable weakness of the nervous tissues, such, for example, as is seen in the evening tire of an active man. There are visible changes in nerve cells consequent upon normal fatigue, thus supporting the hypothesis and argument of those who teach that there is a molecular and chemical alteration in pathological fatigue, manifested as a condition of exhausted nutrition. The question of the influence of autogenous toxic substances is approximately answered by the writer in the affirmative from the analogies which are presented by our rapidly growing knowledge of the action of bacteria in the body. Just as ptomaines are noxious to the microorganisms producing them, so are normal cells injured when the products of their own activity accumulate about them. The following is Dr. Cowles' systematic definition of the disease he is considering: "Neurasthenia is a morbid condition of the nervous system, and its underlying characteristics are excessive weakness and irritability or languor, with mental depression and weakened attention." He dwells with special emphasis on the position that the mental symptoms of pathological fatigue are entirely harmonious with the physical phenomena of neurasthenia, and that these, as far as they can go, are in their turn in agreement with the march of events in melancholia. And he adds that neurasthenia may be regarded as the initial term of many another nervous derangement having wide and varied causations. Dr. Cowles' remarks upon two of the prominent specially neurasthenic conditions are interesting. The first of these is the state of "morning tire," or "morning depression." This is sometimes termed the "morning misery," but the essential element is tire, where the patient awakes in the early morning and is unrefreshed by sleep. The second is that paradox of neurasthenics which is known as the *anæsthesia of the sense of fatigue*, a descent towards the depths of nervous prostration which indicates the waning of sensory power. The sense of fatigue—a natural sensation—ceases to guide the patient. He is conscious of both mental and physical incapacity, but he cannot agree with those who warn him against over-exertion.

These patients are both self-deceiving and misleading to others: these are they who "travel on their nerves" and who are sent abroad to recruit by travel and a change of scene, when they have only the illusory appearance of the strength to undertake it. So, too, should be remarked the converse of this proposition, when these invalids are in the process of restoration to health; they must of necessity come back to "the sense of feeling," as this æsthetic state departs, and what is the result? They say they feel worse, when they are getting stronger; they alarm their friends, perhaps mislead their medical advisers, but the process is nevertheless an appropriate and almost inevitable step along the upward path to convalescence. So that one might be pardoned who would say of neurasthenia: Its name is Legion and the truth is not in it. There are not a few points in the study of the downward and upward course of this affection where at the alienist has the advantage—both in diagnosis, prognosis and in treatment—over the average practitioner. These patients are sometimes said to be supersensitive of conscience and are known to be self-reproachful because they accomplish so little. They especially feel the burden of household duties, and the fault is not infrequently ascribed to the *res angusta domi*, but in this view of the case, these conditions just named and all their congeners are contributive and non-essential. They are environments, extrinsic to the true trouble.

Sometimes these patients display their paradoxical abilities by extraordinary "spurts" of apparent endurance, but they have all to be "paid for" with a repentance and recoil that are quite sure to take the form of a renewed and intensified self-reproach, with all its harmful consequences.

Concerning "worry," Dr. Cowles says but little, but he does advise the breaking up of painful association, on the ground that a change from all the usual surroundings often does great good. Even homesickness may become an advantage—since it is a different and more natural form of "worry," that works to advantage when it displaces a morbid worriment. As to insomnia in these patients, the elimination of waste products is logically a prime element in the treatment. Sleep should be promoted by the use of as little narcotic drugs as possible. The tendencies of the latter are to spoil the appetite and to produce secondary morbid effects; a forced quietude of the brain cells may not promote their rest and nutrition. A drug having a disagreeable taste is the least harmful, as for example the paraldehyde mixture of Dr. Folsom of Boston, which consists of a few minims of that drug in a drachm of chloroform water, and this can be repeated a number of times; sulfonal is at present to be placed among the safest of the hypnotics. Warm baths and feeding at night answer very well in many cases.

In addition to this paper of Dr. Cowles, there is another by Dr. F. H. Williams on "Nourishment in Acute Disease." It is a practically conducted study, not altogether foreign to the subject we have been considering, and we will be glad if we shall be enabled to repeat some of its salient features in a future issue. There are also surgical and obstetrical contributions of more than ordinary interest, which we cannot even name.

MISCELLANY.

MITCHELL DISTRICT MEDICAL SOCIETY.—At the meeting of the Mitchell District Medical Society in Columbus, Ind., December 17, and 18, 1891, the following papers will be presented.

First day.—"Is the Treatment of Phthisis Pulmonalis a Success?" Dr. S. A. Rariden, Bedford.

"The Respiratory Complications of the Disease called La Grippe," Dr. Theodore Potter, Indianapolis.

"The Use of Alcohol in the Practice of Medicine," Dr. Homer J. Hall, Franklin.

"Tetanus, with Report of Cases," Dr. John D. Simpson, Bedford.

"Intubation of the Larynx," Dr. Joseph Eichberg, Cincinnati.

"Intubation in Diphtheria," Dr. P. R. Taylor, Louisville.

"The Enlarged Tonsil," Dr. Dudley S. Reynolds, Louisville.

"Surgical Treatment for the Relief of Nasal and Nasopharyngeal Reflexes," Dr. L. C. Cline, Indianapolis.

"Correct Pronunciation of Medical Terms," Dr. M. N. Elrod, Hartsville.

Evening Session.—Public Address, Dr. G. C. Smythe, Greencastle.

Second Day.—"The Necessity of Surgical Knowledge in General Practice," Dr. J. R. Jenkins, Shelbyville.

"Posterior Spinal Sclerosis," Dr. H. M. Lash, Indianapolis.

"The Pathology of Nervous Exhaustion," Dr. A. B. Richardson, Cincinnati.

"Abdominal Section, with Report of Cases," Dr. Wm. H. Wathen, Louisville.

"Recurrent Pelvic Inflammation," Dr. L. H. Dunning, Indianapolis.

"Hæmorrhage at or near the Menopause," Dr. C. A. L. Reed, Cincinnati.

"Antiseptics in Rectal Surgery," Dr. Jos. M. Mathews, Louisville.

"Reflex Disturbances from Rectal Disease," Dr. J. M. Cook, Indianapolis.

"Skin Grafting," Dr. A. M. Owen, Evansville, Ind.

"Remarks on the Treatment of Urethral Stricture in the Male," Dr. W. N. Wishard, Indianapolis.

"The Radical Treatment of Inguinal Hernia," Dr. A. J. Banker, Columbus.

Hotel rates, \$1.50 per day; reduced rates on railroads entering Columbus.

Columbus is one of the best towns in Indiana, and the local profession will spare no pains to make this meeting a success in every way.

ELIJAH S. ELDER, A.M.M.D., Indianapolis,
President.

GEO. W. BURTON, M.D., Mitchell, Secretary.

Chairman of Committee of Arrangements,

GEO. T. MCCOY, M.D., Columbus, Ind.

THE MEDICAL SOCIETY OF THE MISSOURI VALLEY.—The next meeting of the Medical Society of the Missouri Valley will convene in Lincoln, Neb., Thursday evening, December 17, and continue in session on the 18th. Physicians reading papers or presenting cases at that meeting will send the undersigned their titles before December 1, so they can appear upon the programme, which will be mailed at that date. F. S. THOMAS, Sec'y.

Grand Hotel Annex, Council Bluffs, Ia., Nov. 15, 1891.

NORTH CENTRAL ILLINOIS MEDICAL ASSOCIATION.—The eighteenth annual meeting of the North Central Illinois Medical Association will be held in the City Hall, Streator, Illinois, on Tuesday and Wednesday, December 1 and 2, 1891.

GENERAL PROGRAM.

Ergot, James Tweddale, M.D., Washburn. Discussion, C. E. Davis, M.D., Peoria, E. T. Goble, M.D., Earlville.

Treatment of Miscarriage, W. A. Mansfield, M.D., Metamora. Discussion, A. H. Kinnear, M.D., Henry, B. L. Bonar, M.D., Streator.

My last One Hundred Obstetrical Cases, G. C. Lewis, M.D., Fairbury. Discussion, Geo. Ryon, M.D., Amboy, T. C. Fenton, M.D., Streator.

Hydrogen Gas Inflation with Negative Results in

Stomach Perforation, E. W. Weiss, M.D., Ottawa. Discussion, E. P. Cook, M.D., Mendota, G. A. Zeller, M.D., Peoria.

Neoplasms of the Post-Nasal Space, J. H. Coulter, M.D., Chicago. Discussion, I. H. Reeder, M.D., Lacon, S. V. Hoopman, M.D., Roanoke.

Clinical Cases—Nasal Polypus and Gastric Catarrh, L. G. Thompson, M.D., Lacon. Discussion, J. C. Hatheway, M.D., Ottawa, C. D. Chalfant, M.D., Streator.

The Use and Abuse of Alcohol, W. L. Rabe, M.D., Dwight. Discussion, J. H. Braffet, M.D., Paw Paw, A. N. Richardson, M.D., Ohio.

Sciatica, C. C. Hunt, M.D., Dixon. Discussion, G. L. Burns, M.D., LaSalle, A. E. Owens, M.D., Dover.

Bright's Disease, H. Ziesing, M.D., Peru. Discussion, J. W. Edwards, M.D., Mendota, G. W. Bronson, M.D., Streator.

Prolapse of Vagina and Bladder in a Child Twelve Days Old, B. S. Roseberry, M.D., Lacon. Discussion, A. E. Palmer, M.D., Morris, W. L. Smith, M.D., Streator.

Has Typhoid Fever a Differential Pathognomonic Symptom? J. Stout, M.D., Ottawa. Discussion, J. S. Whitmire, M.D., Metamora, J. W. Pettit, M.D., Sheridan.

General Country Practice, W. G. Putney, M.D., Prairie Centre. Discussion, F. C. Robinson, M.D., Wyandot, F. M. Pendleton, M.D., Magnolia.

Special Program for Tuesday evening, December 1, 1891. Annual address of the President, by J. A. Freeman, M.D., Millington. Subject, The General Practitioner.

General address by W. T. Belfield, M.D., Chicago. Subject, Some Diseases of the Urinary Organs.

The first session will begin on Tuesday, December 1, at 10:30 A.M.

Members assigned to open the discussion of papers will be limited to ten minutes and volunteer remarks of others to five minutes.

Physicians eligible to membership are invited to unite with this Association and contribute papers, clinical reports or professional experience, and engage in the discussion of papers presented at its meetings.

Members of the dental profession and others interested in the study or progress of medicine and surgery or allied subjects are at all times cordially welcomed in attendance upon its sessions.

Copies of by-laws and membership blanks forwarded on application to the secretary.

J. A. FREEMAN, M.D., President.

WM. O. ENSIGN, M.D., Secretary.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from November 14, 1891, to November 29, 1891.

Capt. Edwin G. Gardner, Asst. Surgeon U. S. A., is relieved from further duty as attending surgeon and examiner of recruits in New York City.

Asst. Surgeon Benjamin L. Ten Eyck is granted leave of absence for one month, to take effect about the 15th inst.

Capt. Charles Richard, Asst. Surgeon U. S. A., is granted leave of absence for one month.

First Lieut. Charles F. Kieffer, Asst. Surgeon (recently appointed), is assigned to duty at Ft. Sheridan, Ill.

First Lieut. Frank T. Meriwether, Asst. Surgeon (recently appointed), is assigned to duty at Ft. Adams, R. I.

Capt. Edgar A. Mearns, Asst. Surgeon, is relieved from duty at Ft. Snelling, Minn., and assigned to duty at Ft. Mackinac, Mich.

First Lieut. Charles Willcox, Asst. Surgeon, is relieved from duty at Ft. Bowie, Ariz., and assigned to duty at Ft. Gaston, Cal.

First Lieut. Henry C. Fisher, Asst. Surgeon (recently appointed), ordered to Ft. Riley, Kan., for duty.

First Lieut. Henry A. Shaw, Asst. Surgeon (recently appointed), ordered to Ft. McKinney, Wyo., for duty.

First Lieut. Samuel R. Dunlop, Asst. Surgeon (recently appointed), ordered to Ft. Sill, Oklahoma, for duty.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending November 21, 1891.

Medical Inspector Theorou Woolverton, placed on the Retired List November 13, 1891.

Asst. Surgeon P. H. Bryant, detached from coast survey str. "Gedney," and wait orders.

Surgeon W. H. Jones, ordered to examination preliminary to promotion.

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No. 23.

ORIGINAL ARTICLES.

PERSONAL HYGIENE IN SCHOOLS.¹

REPORT OF W. L. SCHENCK, A.M., M.D., FROM
THE COMMITTEE ON SCHOOL HY-
GIENE, A. M. A.

*Read before the Section of State Medicine, at the Forty-second An-
nual Meeting of the American Medical Association,
at Washington, D. C., May, 1891.*

BY W. L. SCHENCK, M.D.,
OF TOPEKA, KANSAS.

*Physical Training—Study—Time and Amount—Recess
and Vacation—Instruction in Hygiene—By Whom
Taught—How Taught—Prevention of Contagious
Disease.*

"Train up a child in the way he should go,
and when he is old he will not depart from it."
The converse of this proposition of "the wise
man" is equally true. The teachers of a nation
forge its future. Its schools are their work-
shops. No vocation is so freighted with respon-
sibility as that which moulds the coming age.

During the formative period of their lives, the
children of America are in her public schools,
and they have far more to do with their physi-
cal, mental and moral forces than either the
home or the church. We say physical, as well
as mental and moral, for while teachers are wont
to consider their business with the mind and
soul, there is no such thing as mental and moral
education *per se*; no such thing as physical edu-
cation *per se*. The development and strength of
the physical and spiritual are constantly interde-
pendent. The evolution of higher types of
human life requires co-education.

As the intellectual and moral man collects,
correlates and manifests all its knowledge through
the instrumentality of the body, and as its tan-
gible relations with this world are dissolved by
the death of the body, we cannot emphasize too
strongly the importance of a personal hygiene
that will secure the full, round development of
body, mind and soul.

Personal hygiene during school life embraces
physical development and physical subjection to
the intellectual and moral forces. The body

must be trained to the requirements of the spir-
itual life, whose healthful evolution can only
obtain through the instrumentality of a healthy
body. Whatever the possibilities of an immor-
tal soul, while connected with the body, they lie
largely in its health and strength, and as each
added year gives larger knowledge and greater
power to the mind, the interests of both the in-
dividual and the State demand that during school
life there shall be imparted such knowledge of
hygienic laws, and such habitual obedience, as
will tend to secure a life of threescore years and
ten, or, as modern science has demonstrated that
animal life is five times the length of its devel-
opment period, of fivescore years.

While physical training must take into con-
sideration all the organs and tissues of a most
complex physical structure, as well as their sur-
roundings, each individual has a heredity and
temperament, environments and an idiosyncrasy
that require personal consideration. One organ
must not be developed at the expense of another,
and that which is weak must be strengthened,
for the whole is never stronger than its weakest
part. The child must be developed into the
semblance of "the deacon's one-horse shay,"

That was built in such a wonderful way,
It ran a hundred years to a day.

For the deacon said :

There is always *somewhere* a weakest spot,
And that's the reason, beyond a doubt,
That a chaise *breaks down*, but doesn't *wear out*.

This development can only be attained through
the formation of habits that will control the pas-
sions, emotions, appetites and desires, and by
such properly regulated exercise as will secure
the regular generation and distribution of ner-
vous force, the free use of the lungs, and a cir-
culatory action that will carry the blood to every
capillary, that will excite normal secretion and
excretion, give a sense of added strength, in
itself invigorating, and insure peaceful and re-
freshing sleep, always avoiding such violent
effort as tends to local injury and premature
death.

In all exercise, gladness is an essential ele-
ment. Joy, faith, hope, are the stimulants that
make exercise, whether physical, mental or mor-
al, healthful. All exercise, especially in child-

¹ This paper should have been published with other papers of
the Section on State Medicine, but was not received by the editor
of THE JOURNAL until Nov. 19, 1891.

hood, must be alternated with frequent intervals of rest. If we watch the gambols of young animals, we note constant change, but such use of every muscle as secures harmonious and healthful development. During school life, perhaps, there is nothing better than Betts' method of physical culture, in which the whole school should engage in concert, at least once during each morning and afternoon session. This exercise, properly conducted, yields the joy of the dance, calls into play all the muscles of the body, brings them into subjection to the will of the individual, and subjects the individual will to that of the instructor. During each session there should be a few moments of rest from study given to quiet social intercourse.

We have seen in the Topeka (Kansas) high school, under the charge of Prof. H. G. Lorimer, three hundred pupils go through all the varied movements of Betts' method with the military precision of a West Point drill, and with an apparent pleasure unknown to the military drill, and at the conversational recess have heard the hum of three hundred voices, at the tap of the bell, cease instantaneously, each half-spoken word cut short as by a flash of lightning. It is needless to say that the benefits of this method are not possible where the wasp-waists, the camel's hump and the kangaroo bend are cultivated; and it was pleasant to observe, in the school to which we have referred, that their distasteful and unsanitary demands were generally ignored by the pupils, their dress permitting the full benefit of the muscular movement. There was no occasion for the anatomist to ask, Where does Miss — keep her liver? how does she inflate her lungs, or keep her pelvic organs in place? what deformity does her bustle cover? Beauty and health are alike preserved by dress that preserves unconstrained the natural form of the body. Upon every attempt of the mantau-maker to improve the masterpiece of the Supreme Architect must be written *failure*.

Every physiologist and sanitarian agrees with old Ben Johnson:

Robes loosely flowing, haire as free,
Such sweet neglect more taketh me
Than all the adulteries of art,
That strike mine eyes, but not my heart.

Utilitarians advocate manual training both as an exercise and as a co-education, arguing that, while it gives health to body and mind, and soul, too, for "the devil finds some work for idle hands to do," it should train the muscles to practical obedience to the will by giving instruction in some vocation that may be of special advantage to the individual and the world; that will enable the pupil to form an idea of what vocation he desires to follow; that will teach him to love useful employment rather than play; that will enlarge his soul and dignify honest labor.

It is asserted that three hours a day given to study, one to drawing and two to the shop educates the whole man, and that while the student makes as rapid progress in letters and science as when the whole time is devoted to them, he acquires a better knowledge of the mechanical art than those who serve a three years' apprenticeship, because the latter is for the benefit of the shop, while the former is for the benefit of the pupil, and that he obtains both a practical and a scientific knowledge of all representative implements.

While this course may not be generally applicable to the public schools, it emphasizes the importance of State, district and city schools of agriculture, mechanics and art. If there should be normal schools, at public expense, to teach teachers and agriculture, why not schools to teach artisans? The Slojd method now being introduced into American schools from Sweden, is well worthy consideration.

There are many children, as of miners, who are kept from school during the winter by necessary labor who should be provided for in a summer school, and in such a school manual training would be a beneficence. In all our larger cities such schools properly located would give the children of their dark alleys and slums, a healthful atmosphere, physical, mental, and moral, and prepare them for a useful and honorable citizenship.

Both boys and girls should have proper instruction in regard to sexual peculiarities, and upon the physical mental and moral diseases consequent upon abuse of sex. There are nameless physical vices acquired in childhood that tell upon the whole life. The school is the best place for their correction. Some may say to name them is suggestive. The argument applies equally to all sin.

In all school régime there must be a flexibility that recognizes sexual idiosyncrasy. Her rapid development into womanhood is a heavy tax on female life, and the educator must devise means to meet the contingency. Until she has safely passed her first climacterix all educational methods must regard this developmental period.

As an extensor muscle rests while its opposing flexor contracts, and as by this alternate action they permit much longer periods of labor than would otherwise be admissible, so if that portion of the brain through which memory acts is used alternately with those portions through which the reasoning and other faculties act there can be longer continued intellectual training without injury. Study should not only be alternated with amusement, muscular exercise and rest, but studies that call into action one faculty, should be alternated with those that exercise other faculties, thereby not only securing rest but systematic and healthful development.

RECESS AND VACATION.

In some schools fashion and the convenience of the teacher demand one long unremitting session. If it was not illogical the worn looks of the pupils, as it draws to a close, should sufficiently condemn it. Each half hour there should be a rest of five minutes. To some this may seem a needless interruption and waste of time, but it will secure greater improvement than when longer periods are given to pretended continuous study.

A large proportion of the children in the public schools are between six and twelve years of age, and in many places there are crowded into the lower rooms from fifty to an hundred children. The younger children are often sent to school for the convenience of the home, and their instruction should be conducted largely on Kindergarten methods, adapting the lessons to the restless life of the pupils, or they should be allowed a recess of each alternate fifteen or thirty minutes, gradually decreasing the length of the recess as the child increases in years.

The crowded condition that frequently obtains in our public schools should be obviated. Frequent recesses and ventilation may to a certain extent remedy the evil but cannot remove it. It is a wrong, moral, mental, and physical to both pupil and teacher. The only excuse for the overcrowding is the expense of more teachers and more buildings. As no vocation is more important than that which develops the life and moulds the character of the next succeeding age, no economy is more false than that which hinders the full round development of the body, mind and soul of those who are to constitute the coming age.

An important and unsettled question is whether the pupils, especially in the more advanced grades, should spend their recess in the school room or out of doors. If they go out it is too often to lounge idly around, frequently obstructing the sidewalk, about which hypersensitive people are sometimes hypercritical, or to engage in some such play as marbles, which gives neither exercise or spiritual elevation, or in over exercise that returns them heated and exhausted to the school room. The only advantage in going out of the school room is to get fresh air, which should come to them more easily than they can go to it. There is no need of leaving the room except for special purpose, which should always be permissible. We can hardly conceive of a teacher so senseless and inhuman as to refuse a pupil permission to respond to the calls of nature.

During the recess exercise, no matter how perfect the ventilation, the windows should be opened before it commences, and closed as soon as it is over. This exercise, in which the whole school should engage, conducted by a competent

teacher, will be as pleasant, and far more profitable than any taken on the play-grounds, no matter how well they may be adapted to the purpose, and the grounds about our public school buildings are rarely what they should be. The grounds about every school building, whether in the country or city, should cover a full square—about four acres, and should be artistically planted with trees, shrubs and flowers, giving sunshine and shade, and making the school form the one green spot in memory. At first blush this may be denounced as the thought of a crank, but it challenges examination. In the average ward school of our cities there are gathered from 500 to 1000 pupils. They need space for ventilation, and trees and shrubs for the healthful exchange of the exhaled carbonic acid gas and oxygen, and for the cultivation of taste, making the school grounds a place of beauty and a joy forever. They are thus made healthful not only for pupils and teachers, but for the whole city. Few cities have enough of these breathing places, and they are nowhere more appropriate than about their public schools. And who will object? The miser hoards his pelf through love of self, but dies at last to leave it to his heirs. Dives may have no regard for the children of the Nation, but the philanthropist and patriot lives for his children and his country's children. Her public schools are the monuments of his love of country, and his interest in those who must soon sustain its honor and maintain its glory. All our accumulations are for those who succeed us. All the duties of life, all the affairs of state will soon be transferred to them. Shall we not make the places where they are prepared to discharge them healthful and attractive? Time was when any room, any where, was deemed good enough for a school, but the world moves. While our parents loved us as we love our children; while Washington said, in his Farewell address, "Promote, then, as an object of primary importance, institutions for the general diffusion of knowledge. In proportion as the structure of a government gives force to public opinion, it is essential that public opinion should be enlightened," they knew as little about the public school and of the relation of the public school to public health as of the telephone or the electric car. Our colleges and seminaries have long recognized the beneficence of beautiful parks. Why not provide them for the schools of the people? Let the State require them of the school district and of every city or village applying for corporate powers, and let the school boards see that their out buildings cease to disgrace humanity and to destroy health.

Those members of the committee who discuss the lighting, heating and ventilation of school buildings will probably decide them defective in the large proportion of both public and private

schools, and thus emphasize the importance of periods of rest, special ventilation, physical training and sanitary surroundings. It is frequently asserted that the child who wants to learn will improve under any teacher. It may be true, as an old Scotch professor once asserted, that "ye canna make a mon out o' mud," but we have equally good authority for asserting that the Master Mechanic did make him out of the dust of the earth. Teachers, like artists, are born, not made, and should mould the virgin clay placed in their hands into men and women worthy the name. This work lies largely in their ability to make knowledge attractive, and to induce pupils to seek it for its own sake rather than for the sake of some ulterior reward, or through fear of punishment. It is through such motives, their worry, anxiety and depression that education becomes a source of mental, moral and physical disease. Point out the possibilities of the soul, awaken the aspirations of the pupil, demonstrate the beauty of wisdom and the power of knowledge, teach how to use facts obtained for the attainment of other facts, put gladness into the heart of the child, make education joyous, lead forth the mind "in green pastures and beside still waters," and there will be healthy and harmonious growth. Tell a child how bad he is and he will be bad, how stupid, and he will remain stupid. The master who marches about the school room with a storm-cloud on his brow, thunder in his voice and lightning in his hand, should be transferred to the kingdom of his satanic majesty, and the teacher who endeavors to instil knowledge through the back of the pupil should remember that "a rod is for the back of fools," of whom he is the chief. The only reason why corporeal punishment in government is restricted to children is their inability to successfully resist. It is cowardly and brutalizing and tends to make all educational methods hateful. "Love is the fulfilling of the law." The mid-day recess is of special importance, as it generally includes the principal meal of the day. Eating thus becomes an important part of the nooning. Children require food for both repair and growth. They should be taught to eat slowly and masticate thoroughly, and to eat with thanks and a glad heart, as sullenness and fault-finding during meals tend to indigestion and disease. They should have a nutritious and easily digested diet, and be encouraged to eat fat, as oil facilitates metamorphosis and is essential to healthy growth. The officers in the regular army are required to inspect every meal prepared for the soldiers and see that the rations are good, properly cooked and abundant, and that the men, selected for their robust health, are clean, well clad and housed, and have regular exercise. Are not its children as much the wards of a Nation as its soldiers? How much more important that

trustees, directors, teachers, parents, all who have charge of the children of the Nation should give careful attention to all that pertains to their health and development. Neither the mind nor body should be permitted active exercise immediately before or after a full meal. Digestion demands nervous energy, and if diverted by mental or physical action there will be indigestion, and mal nutrition. Children living long distances from the school should have a dining hall near by, or carry their dinners with them. Instead of eating alone, in a corner, there should be a proper room assigned for lunch, or a picnic in the grove that should surround the school building, where the children of the rich can exchange their luxuries for the homely fare of their poorer school-mates, learning that it is "more blessed to give than to receive," and finding good digestion in receiving and communicating joy.

During school life the importance of refreshing sleep, and enough of it, cannot be too strongly emphasized. Exciting entertainments, late study, everything that trenches upon the hours that should be devoted to sleep, or causes insomnia, must be avoided. The "six hours sleep for students and eight for babes and fools," is as senseless as "Graham gems for students." The development of a strong mind in a strong body requires a nourishing diet, plenty of exercise and plenty of sleep, and a time for everything and everything in its time.

Action in any part of the body destroys tissue, but it carries an increased flow of blood to the part, increased cell proliferation and vital force, and increases the demand for rest and repair.

Vacations should embrace the warm months—July, August and September—and the long session should be broken by a fortnight's rest at Christmas, and perhaps a week at Easter. During the long summer vacation the pupil should seek physical development by engaging in home labor, or by a summer outing, according to pecuniary ability and residence.

Some sanitarians advocate one long school session. Permit me to quote from a paper read before the Kansas State Sanitary Convention, 1886, which I still endorse:

"The protracted daily sessions practiced in some places are unsanitary. They may minister to the convenience of the parents and teachers, but they violate every principle of school hygiene. In childhood and youth the brain and muscle, because of their ready wear and tear, soon tire, but they are quickly renewed if opportunity is given for repair. The long five hour sessions not only cause excessive exhaustion from long continued labor, but they give no time for dinner, a necessity to the growing child, who should have three meals each day, with an ample meal at noon, with time to eat and digest it. . . .

A sufficient nooning, with a meal near at hand, is a school necessity.

"When the five hour system is practiced, a single glance, during its last hours, at the worn, weary and anxious faces of the pupils, and at the unseemly haste with which they leave their *prison-house*, are sufficient to condemn it. Long continued attendance, with fixedness of muscle or mind, are incompatible with health at any school age."¹

STUDY—TIME AND AMOUNT.

Very few persons are ever injured by study properly pursued. Regular, methodical brain work, adapted to the physical and mental strength of the student, is as healthful as other labor. It vitalizes while it stores the mind with useful knowledge and keeps alive interest in the world of thought and duty. Dunglison in his *Human Health* says, "Literary pursuits are directly favorable to long life, whether they require the exercise of the memory, the judgment or the imagination, and when the health is apparently injured by them the evil is dependent rather on collateral circumstances." Mental development is in harmony with all we know of the laws of life. It is only its methods and associated conditions that injure. All education must keep in view the importance of such development of the spiritual powers with which the Creator has endowed man as will secure the greatest good to the individual and to the world. Pure intellectual culture does not control a tendency to debauchery and crime. Education must develop those powers that hold in subjection the appetites, passions and desires, that, unrestrained, unbalance the mental and moral forces and tend to disease and death, transmitting hereditary tendencies that produce physical, mental and moral debasement in the whole line of posterity. *Morality*, the righteousness of right thinking and right doing, must form a part of all education. "Virtue and morality are a necessary spring of popular government." Their culture involves a knowledge of the meaning of our existence, and the existence of the world about us, a knowledge of the final causes of the universe. Though theology, as commonly understood, should not enter into the education of our public schools, a knowledge of God and humanity, and of our relations to both, is essential to the public good. Nothing else will press home to heart and mind the duties we owe to ourselves and to each other as component parts of a great government, as members of a common family. Nothing else will keep alive interest in those governmental measures and methods that protect the health, and secure the development and prolong the lives of the people.

The physical as well as the mental and moral health of the pupil is injured by the sensational novel that unduly excites passions and emotions that should lie dormant in childhood. Every book with an impure, hidden meaning should be as far removed from children as those that indulge in open infamy, and both the minds and morals of children are debased by the detailed and realistic reports of crime that occupy no inconsiderable portion of the daily press.

"Vice is a monster of so frightful mien
As, to be hated, needs but to be seen;
Yet seen too oft, familiar with her face,
We first endure, then pity, then embrace."

If the public stomach did not demand it the newspapers would not wallow in the gutter of moral filth to gratify its appetite. Where can the public taste be corrected and the moral purity and strength of the nation be developed better than in the public school?

The machine work so common in many schools is responsible for much of the disease charged to education. All school methods must possess a certain amount of flexibility. Every child has its idiosyncrasy which the successful teacher must give, as do successful physicians, the fullest possible consideration, and during school life there are additional exigencies, such as the passage from girlhood to womanhood, that cannot be safely ignored, and that demand relief from worry, rest from work and protection against inclement weather, without a demand from *the master* of the why and the wherefore. He should know enough of physiology and psychology to understand that girlhood has functions that a proper delicacy does not care to reveal.

Though we may not measure the effect of certain conditions, or the force brain or muscle may safely exert under special stimulants, or how long they may be continued, we know there are limitations that vary in different individuals and under differing conditions, and that the power of continued endurance is never so great in childhood as in mature life.

Long continued, unintermitting action, whether of brain, muscle or gland, exhausts nervous excitability. The nearest approach to perpetual activity is found in the involuntary muscles, but there nature provides alternating action and rest, systole and diastole, inspiration and expiration. Rest is as necessary to recuperation of brain as of muscle. Sir Walter Scott, when asked how many hours he devoted to study, replied, "I reckon five and a half hours a very good day's work for the mind when engaged in original composition. I can very seldom work six hours, and I suspect what is written after five or six hours of hard mental effort is not worth much. I try to get two or three of these hours in before breakfast, and the remainder as soon after as may be,

¹ "The Sanitary Conditions of School Houses and School Life," by W. L. Schenck, M.D., Annual Report of Kansas State Board of Health, 1886, p. 184.

so as to have the afternoon free to walk, or ride, or idle."

If the strong mind of England's great author could not endure more than five or six hours of daily mental effort, what are we to think of the educator who would work his immature pupils all day and half the night?

After the long fast of the night, most persons require a light breakfast, preceded by such exercise as comes from a morning bath, followed by a good rubbing, before commencing study. For the school child the bath, home chores and the school road are exercise enough for the morning, and three hours of study during the morning, less the amount deducted for conversation and calisthenics, and three hours after the nooning, is study enough for children commencing their 'teens, with an hour or two in the evening as they grow older.

INSTRUCTION IN HYGIENE.

If practical hygiene is important to school life, pupils should be taught, as far as they are capable of comprehending, the principles upon which it is based, and its application to the broader fields of life upon which they must soon enter. If the development of the intellectual, moral and physical forces of the children of the nation is important, their preservation is not less important. This involves a knowledge of the laws of life and the causes of disease, and the means of their prevention, removal or restriction. Biology and physiology, etiology and preventive medicine, should form an important part of all education. Properly pursued, they interest while they instruct, and while they store the mind with knowledge of vital import, they stimulate to investigation and research. And when the electors of a State and their representatives have learned that through vaccination properly enforced by all nations, small-pox will exist only in history; when they understand that filth accumulations not only infect the air we breathe, the water we drink and the food we eat; not only engender and intensify septic diseases, but make every injury and disease more formidable, there will be adequate legal provision for the protection of the health and life of the people. How is this to be known unless taught? how taught without a teacher? Many of the States provide that physiology and hygiene, and the relation of alcoholics to health, shall form a part of our common school education. But as comparatively few of the teachers in the public schools have more than a crude and elementary knowledge of these important branches until they acquire the required knowledge, the State should provide special instructors to teach both teachers and pupils, and the instruction should be as far as possible macroscopic, microscopic and chemical, by lectures and through scientific text-books.

PREVENTION OF CONTAGIOUS DISEASES.

It is the duty of the State to protect those it gathers into its public schools, and to protect the community against the diseases that may be disseminated through the school, while private schools that fail to extend known and needed protection should be held for the disease they occasion. Childhood is especially susceptible to infectious and contagious diseases, both because of its impressibility and its lack of exemption through contact, and in childhood many of the zymotic diseases are especially grave. In America the free schools gather their pupils from all classes and localities, and for many hours keep them in crowded rooms and in the closest personal relations. In no other assemblage of human beings is there greater opportunity of contracting and spreading contagious and infectious diseases.

When a contagion appears in a school, there is sometimes a doubt as to the best course to be pursued. The common one is to dismiss the school. When small-pox comes to a private house, we isolate the individual case, disinfect and vaccinate all who have been exposed, and keep them under strict surveillance until danger has passed. When yellow fever invades a city, we throw a cordon about it, and prevent those who can carry with them the contagion from leaving the district until safety is assured. When a case of small-pox occurs in a college it is isolated, those who are known to have been in contact with it are kept under inspection, while all others go to their several homes. Why? If they have not been exposed to the disease, while those who have are isolated, why not continue the college exercises? If they have been exposed, sending them away may communicate the disease to those they meet *en route*, or establish it at their homes. Scarlet fever, diphtheria or measles occurs in a public school. What shall be done? Dismiss the school? Yes, if it is best to turn those that have been exposed into the street, that they may carry the disease whithersoever they will. Is it not better to have existing cases isolated, those who are known to have been exposed reported to the health officer, the rooms where they attended thoroughly disinfected, and the school continued. Is not this better than to give those *who may have been* exposed the freedom of the city? When a grave epidemic prevails, the conditions are changed, and the public school should be closed.

It is hardly necessary to say that children from a home where a grave contagious disease exists should not only be kept from school, but from the street, and should be thoroughly disinfected before they are permitted to return to society. What are the grave diseases that should exclude from school and from society? On this question

sanitarians may differ. Some may include consumption, others typhoid fever. All are not agreed that the former is contagious, and its course sometimes covers enough of life to exclude a whole family from all school privileges; the latter, communicated through discharges from the alimentary canal conveyed to the alimentary canal, will hardly be carried to school. Small-pox is still the terror of the people. For ages it was the great destroyer, attacking one-sixth of the entire population of the globe, destroying one-half of those attacked, robbing those it spared of their comeliness, and often of all hope of health. While to the unprotected it is as virulent as ever, since the discovery of the immortal Jenner it is easily shorn of its power, the possibilities of contagion being reduced to a minimum by a measure that rarely involves either hardship or danger. Neither the incipient insanity of the rank, nor the unrighteous greed of the quack, who would fatten on its desolations, should be permitted to allow any child to enter a public school until properly vaccinated. When a case occurs in a school district, there should be revaccination until no effect is produced. To make assurance assured, children from the home where it exists should not be admitted to the school, and should be kept from the street.

Diphtheria, scarlet fever, cholera, yellow fever, measles, mumps, pertussis and scabies, should exclude children from the homes where they exist until safety is assured through the certificate of proper health officer.

As that which is to be evolved through that which now is, the State has no more sacred duty and can have no grander aspiration than the protection of its children from all that deteriorates, and the development of all that strengthens and ennobles.

CONTRIBUTION FOR DEFINITE AND KNOWN QUANTITY AND QUALITY IN MINERAL WATERS.

Read by title at the Meeting of the Mississippi Valley Medical Association, Oct. 14, 15 and 16, 1891, held at St. Louis, Mo.

BY GEO. F. HULBERT M.D.,
OF ST. LOUIS, MO.

As medical science steps forward in her ceaseless stride for more and better understanding of disease in the human economy, so too is the care and necessity created for better and more efficient means of relief. The study and use of our armamentarium at our command for this purpose has gradually and steadily brought before us that exceedingly valuable class of remedies known as mineral waters.

Nature, in her beneficial and bounteous provision for the wants of mankind, has herein provided a weapon of defense, which, unfortu-

nately, has not commanded the special attention of the profession *en masse*, but has been accepted and utilized by only the few. Why this has been so is easily understood.

1. The presentation of the character and value of mineral waters has only too frequently been in the lines of the charlatan and unscientific, advertised by those interested in a reckless, catch-penny style, and certified to by those who are incompetent to diagnose the conditions for which they are desirable or applicable.

2. The necessity of proceeding to the source of supply for the full benefits on the part of the patient, or accepting the admitted makeshift, purchase and use of the waters at home, put up and prepared only too frequently in an altered and inefficient condition.

3. The failure on the part of the profession in the use of natural mineral waters as presented in the open market to get results claimed by those interested.

4. Those who have overcome the difficulties presented have, speaking in a general way, done so by the use of the artificial product.

The subject is of sufficient importance, and the benefits to be derived are of such a character, that we feel compelled to speak plainly, and to the point, as to the why and wherefore of this discrepancy, in order that the way may be pointed out to intelligently evade the difficulties and disappointments.

It is agreed that the therapeutical value of a mineral water is dependent upon the quality and quantity of its solid ingredients, and the temperature at which it issues from the earth. Dr. F. A. Struve, of Dresden, more than eighty years ago clearly established the fact that the composition of a mineral water was due to the dissolving of mineral substances from the geological strata through which the water passed, through and by the aid of the solvent gases (carbon dioxide), a more or less high temperature, and the action of increased pressure in the interior of the earth. The water then, at the *mouth of the spring only*, will contain its full development chemically and exert its full effect medicinally.

The mineral substances composing the active principles of mineral waters are mainly soluble alkaline and earthy salts, and such metallic ones as are readily soluble, but whose solubility is quickly changed by various combinations with oxygen. The omnipresent oxygen of the atmosphere, the volatile propensity of the carbon dioxide, the release from pressure, as well as change in temperature, necessitates an almost inevitable prompt chemical change on the escape of the water from the spring. This is specially noticeable in the ferrous and manganous waters. They are seen bubbling up in clear, sparkling, pure compositions from the bottom of the spring, which, upon discharging into the open air,

promptly and fully precipitates the sensitive metallic salts in the form of the insoluble ferric and manganic salts. In those waters containing the earthy carbonates, the release from pressure on their appearance at the surface of the spring at once precipitates them as mono-carbonates by setting free the other equivalent of carbon dioxide. This would not have occurred if the proper degree of pressure had been maintained.

At Carlsbad, the hot "Sprudelwasser" forms a thin, earthy and ferric carbonate on the side of the glass while the patient is slowly emptying it, thus proving the prompt and almost immediate decomposition of thermal waters.

Dr. Geo. E. Walton, in his "Mineral Springs of the United States and Canada," page 113, says: "There is not the care used in bottling waters that should be observed, and there are but few waters that are adapted for shipment."

From the above, it is readily seen that only at the spring itself are we positive and sure to receive the water as Nature has elaborated it and prepared it for the use for which it is applicable.

It is well to remark that the mysterious occult properties so much enlarged upon by the parties interested in any particular spring or springs is not comprehensible to the scientific mind, but must be referred to the personal equation of the patient. The real fact that is thus presented consists only in the *combination on the part of Nature of conditions accomplishing a certain purpose* that gives a value to this or that spring. To the uninformed this is unknown, therefore occult; to the chemist it is determinable and known, therefore ceases to be occult.

As regards the question of analysis of the waters as actually presented by Nature, there have been and are to this day many chances for error and careless work, but the scientific chemist of to day is perfectly competent to determine the exact ingredients and their quantity, so that the statement made by some of the impossibility of giving a correct analysis will not hold good.

The essentials for this work are as follows:

The analysis of a mineral water must commence at the springs. Its temperature must be ascertained at different times of the day, and its relation established to the temperature of the surface.

The emission of gases, and their nature, has to be observed, and samples of the water mixed here, with known quantities of re-agents, to determine the quantities of free gases contained in the spring. The water to be examined at the laboratory should be carefully filled into glass-stoppered bottles from underneath the surface of the spring, in order to avoid any and every decomposition by access of the air. Chlorine, sulphuric acid and silicic acid must be determined in separate quantities of water; iron, lime and magnesia are determined in the same quantity of

water, one after another, as it is necessary to separate the iron before you can determine the lime, and this substance before you can get at the magnesia.

The alkalies must be determined in a portion of the water from which iron, lime and magnesia have become separated by such processes as do not add any alkaline substance to the water. Aluminum, barium, strontium and manganum oxide or protoxide, as well as phosphoric acid and iodine, bromide and other substances which usually occur in mineral waters in but small quantities, are determined from large quantities of water concentrated by evaporation in such manner as to obtain also the volatile substances in separate vessels and solutions.

If carried on correctly, and the water for analysis has been obtained at and from the springs in the proper manner, all volatile and solid ingredients can be determined by the expert chemist, except the mysterious soul of the spring which is attributed to them by people who believe in supernatural powers in mineral-water springs.

In the very nature of things, then, the great labor, expense and scientific knowledge required to properly comprehend and overcome the almost insurmountable difficulties, do we see why it is that mineral water, as found at the springs and in the market, differ so much in quality and results attained by their use. The door is open to all sorts of deception, and the results of accurate scientific investigation of many of the products presented in the open market and sold as the real genuine natural product, are startling in the discrepancies discovered.

As illustrating the facts discovered, the "Carlsbad Sprudel Salt" was found to contain 85 to 98 per cent. of glauber salts, when the analysis of the water at the springs showed the percentage in the solid contents to be only about 45 per cent. Again, in the Apollinaris, it is found to have no iron and much salt, due to the manner in which the water is obtained and put up, while at the springs iron is present and much less salt.

Again, in "Determination of Lithia in Mineral Waters," by E. Waller, Ph.D., a paper published in the *Journal of the American Chemical Society*, Vol. XII, No. 6, we find further testimony of unreliability in "quality and quantity" of the several natural lithia waters as presented for sale in the market. After giving the three methods non-available for determining the amounts of lithia salts—1, the phosphate method (Maynard's modification); 2, the amyl alcohol method (Gooch); 3, the flouride method (Carnot)—in all of which the spectroscopic test is applied for control of errors, he arrives at the following definite results:

In the Farmville Lithia Water, after repeated experiments with large quantities of the water

(10 litres), concentrated by evaporation only, sufficient lithia was found to produce the lithia line in the spectroscope, but not enough for quantitative estimation. With the Buffalo Lithia Water the reaction for lithium was more distinct when considerable quantities of the water were concentrated. From 20 litres of the water was obtained lithium sulphate corresponding to 0.0185 part Li. H. CO₃ per 100,000 of water.

Dr. Karl Luedeking, chemist at Washington University, in making an analysis of the No. 2 Spring water of this concern, failed to find any lithia whatever.

The Londonderry water gave the lithia reaction without much difficulty, being a little over 4 parts to 100,000. "The company puts up some of the water in half-gallon bottles (called in their circulars 'Sulpho-Carbonated'), which is charged with CO₂, and has also received the addition of some salts. The amounts of salts added appear to be somewhat irregular. For instance, the following results were obtained in parts per 100,000 of the water :

Half-gallon bottles,	37.35	total solids.
Pint bottles A.,	149.4	" "
" " B.,	104.2	" "
Average of 11 others,	224.7	" "

The proportion of lithium was the same as for the still water."

This extract, taken from the paper of Prof. Waller, in connection with the further statement that at several times the water has been found to contain no lithia whatever by other competent chemists as well as by himself, as well as the fact that none of the water can be obtained from the springs by disinterested parties or visitors, all access to the springs being denied, and applications for water referred to the bottling establishment in Nashua, needs no comment from us; the facts speak for themselves.

The Saratoga Hathorn proved to be the strongest lithia water examined, and contained the full percentage the analysis calls for (12 to 14 parts Li. H. CO₃ per 100,000 parts of the water, corresponding to $\frac{7}{8}$ grains per U. S. gallon).

One of the most difficult class of waters to handle away from the springs is the Ferro Manganous. We are pleased to give honor and credit to one of these springs, at least, for a determined endeavor to meet the requirements, and that is to the *Excelsior Spring Co. of Missouri*. They have simply accomplished all that can be done in the direction of presenting their product at a distance from the springs in its natural composition. The water of the spring referred to, "The Regent," is a Ferro Manganous water. It is only put up in bottles. The supply pipe to the bottling rack is started well down beneath the surface of the spring, a large hood being on the end; the water is then carried direct to the bottling department through pipe and pump.

Carbon dioxide is forced into the empty bottle, thereby expelling the atmospheric air from it; then it is filled with the water under high pressure of carbon dioxide, and securely corked. In this way at no time does the water come into contact with the oxygen of the air, and therefore retains its delicate chemical composition. It is consequently rare to find any precipitate in the "Regent Water," as it is called, of this spring, clearly proving the fact that its composition is the natural one. For a water of its class it is not excelled by any, and to those who can go to the springs, the "Regent Water" and the "Elms" are a delightful, health-giving combination to enjoy.

With the known variation from time to time in the proportion of ingredients of mineral waters at the springs, as well as the exceedingly weak impregnation of most of them by mineral substances necessitating the use of large quantities for very long periods, and the undoubted liability to and fact of their alteration, adulteration, chemical variability as compared to the natural product at the springs, it is not at all strange that the profession at large has little satisfaction or confidence in their use. In all cases where we get definite results, it is due to the fact, that we have a water of sufficient power and quality. The attainment of results being the exception, what can we do? *Use what we know has a definite quality and quantity at all times and results will be definite.* Hence we find a legitimate and useful field for the artificial product. *The necessary source* for the artificial product is an *honest, competent, scientific chemist.*

The following is taken from Liebig's Chemical Dictionary, 1851, Vol. v, p. 320. "Prompted partly by scientific interest and partly by the desire to offer to sufferers who live long distances from mineral springs an opportunity of enjoying their beneficial action, efforts were made to reproduce these waters by artificial process—and in the course of time this end has been attained with such perfection as to permit the artificial product to place itself along side of and compete in every respect with the natural mineral waters." This is authoritative commendation of honest and scientific labor, the pioneer in which was Dr. F. A. Struve, of Dresden, who established and proved not only by actual experiment the theory of the natural formation of mineral waters, but produced the first artificial Carlsbad water and administered it in conjunction with Dr. Soltmann, in the first season to over 300 patients, with results fully as satisfactory as attained in the use of the natural Carlsbad Sprudel at the Springs. The good work has progressed until to-day, when there is no mineral water of any positive value which has not been satisfactorily manufactured, and best of all, there is no mineral water known that cannot be and is successfully

modified or improved to meet the determined requirements of any disease for which it may be of value. In this country humanity as well as the medical profession is under lasting obligations to two gentlemen who have, in spite of every conceivable obstacle that could be thrown in their way by interested parties of mineral springs and products, steadily and persistently applied their scientific (medical and chemical) attainments and means, to the end that there should be presented to those desiring them, artificial or manufactured mineral waters of a positively known and definite value as relates to quality and quantity of solid ingredients, and thus insure efficiency and prompt results in their use. We refer to Carl H. Schultz, of New York, and Dr. Enno Sander of St. Louis.

It is only those who are familiar with the mineral water question and the celebrated mineral water controversy, "that can appreciate" the work accomplished by these gentlemen, and when we consider that scientific precision in the manufacture, honesty of purpose in the presentation of their products, and broad scientific equipment and attainments in qualification for the work they had in hand, have been the motive and power behind the throne, "damning with faint praise" is simply an impossibility from any one actuated by the principles of truth and honor.

Our practical experience with the manufactured product has been confined to that of Dr. Enno Sander, of St. Louis, and for the purpose of demonstrating their purity and efficiency we desire to call special attention to only three of the waters of this laboratory. "The Tenfold Carlsbad Sprudel," the "Garrod Spa" or "Lithia Potash Water," and the sparkling "Benzoated Lithium Water."

The Carlsbad Water is made in three strengths, the single, double and tenfold; the purpose of this being to enable the consumer to get the full advantage of the original *thermal* effects, without exposing the manufactured water to the risky and decomposing influences of heating each dose. This is at once accomplished by taking an equal or many fold quantity of hot water, adding direct from the bottle the necessary quantity of the mineral water and at once drinking the same.

The value of the Carlsbad water is beyond controversy and cavil in most hepatic troubles and many gastric intestinal diseases; hyperæmic conditions of the liver from whatever cause are most frequently relieved. This one therapeutic effect is of extended range. Frerichs testifies in no doubtful manner as to hepatic diseases. Niemeyer is exceedingly explicit as to the value and benefits derived in gastric catarrh.

As illustrating the efficiency of the Sander's artificial product, we present the following case of hepatic hyperæmia and catarrh of hepatic

ducts and duodemia, with the development of biliary gall stones, treated by the use of the "Tenfold Carlsbad Water." J. H. P.: American aged 50; came under my observation January 1st, 1889. His family history was a remarkable one of intemperance and abuse of alcohol. His father, three uncles, both grandparents (male) and three brothers were what to-day in common slang would be termed "steady lushers," with no choice as to quality of liquor consumed. No history of rheumatism, gout or nervous disease, but in all there were intestinal and gastric troubles. Individually the patient had been a constant steady miscellaneous drinker from 28 years of age up to 46, rarely what he considered intoxicated. All during his life and up to this time had never been sick or incapacitated from his labor, that of bank teller. Since 46 years of age he has been temperate, rarely using anything. About two years ago, without any apparent cause or deterioration of his general health, he began to suffer with pains in the right lumbar region, more like a soreness or oversensitiveness, not aggravated by motion. The attack would commence every night from 9 to 11 P.M., and become sufficient in severity to disturb his rest; relief was usually attained in an hour or two by means of hot mustard applications. This deviation from health was accompanied by rectal disturbances in the way of a prolapse of moderate severity, and continued for a period of six months with no apparent aggravation, when pain was noticed in left part of right hypochondria. This, while, like the other pains, was more severe and developed an ill-defined sense of threatened danger. Shortly after, bleeding of the abdomen supervened and his nightly sense of misery became more severe, to the degree that medical advice was demanded. "*Parri passu*" with medical attendance his sufferings increased, demanding opium for relief, until the crisis was at last reached by a severe attack of nausea and vomiting and the appearance of a pronounced attack of jaundice; pains ceased, jaundice gradually disappeared and for nine months he was a well man in his own opinion. The second attack then supervened, passed through the same stages, save that it lasted only ten days and was tenfold more severe. Clay colored stools were noticed during this attack; the lumbar distress did not entirely subside with the close of this attack, but nightly visited him for about two months, when his third attack came on, less severe than the second, but requiring three grains of opium every night to relieve it; it prolonged, up to the time we first saw him. Examination revealed a moral coward in a man of education and intelligence, completely cowed by his sufferings; fat and flabby of tissue, skin dry, tongue heavily coated, bowels fairly regular, appetite fair, urine smoky with bile reaction;

sensitiveness over duodenum and ileo-cæcal valve, no distension of the bladder detected, liver enlarged, but not sensitive. Every means and method of treatment found on the books or known to us was faithfully tried. That seemingly giving the most temporary relief and keeping things in abeyance, was the use of *dioscorea villosa* in conjunction with *papaya carica* and saline purgation. The sweet oil method was a total failure. By the above means it was possible to dispense with opium save now and then. Close and continued examination finally revealed biliary hepatic stones. No large concretions were found at any time. This cleared up the question as to the part played by the condition of the hepatic ducts, and Carlsbad Sprudel water (Sander's) was selected as the sole therapeutic measure. A wine glass of the tenfold strength in a goblet of *hot water* was used three times a day; in one week his pains entirely ceased, general health began to improve and in one month he was symptomatically in his normal condition. The water was continued for three months steadily, when it was cut down to a single dose at bed time and kept up for two months more. He has not had an attack since; from time to time he uses the water as a safeguard on his own responsibility.

Another case of hepatic disturbance in which the condition seemed from the evidence to be inspissation of the gall, coming on at irregular periods, occurred in J. A. R., a Pullman palace car conductor. His attacks were preceded by a period of constipation and gastric duodenal distress lasting for about a week, when a severe attack of hepatic colic would develop, gradually and steadily increasing, reaching its acme in severe nausea and vomiting. No jaundice was present nor has been at any time. Free saline purgative usually brought temporary relief. He was placed upon Carlsbad water tenfold (Sander's) and for nearly two years has not had an attack; the water was used steadily for six months.

The formula of the Sander's Carlsbad is that of the Natural Carlsbad Sprudel, as determined by the analysis of Berzelius and Bauer; being rich in its proportion of sodium sulphate, carbonate and chloride, and positively uniform in strength, it is readily seen, why in its use we are enabled to attain uniform results. In the use of the Carlsbad water it is necessary that the same care and conditions be attained in its administration as at the springs. It is an alkaline *thermal* water, it must therefore be used hot, 112° to as hot as can be borne. The range in temperature at the springs is from 112° to 152°. The best time for use is an hour before or two to three hours after eating. Used with these precautions and for a sufficient length of time, no one will fail to get definite and positive results from its use.

In our consideration of the Garrod Spa, the Lithia Potash Water, and the Benzoated Lithium Water of Sander's Laboratory, we are in a position to speak positively as to their value in rheumatism, gout, lithiasis, and allied disorders, having absolutely discarded from our armamentarium in the handling of these diseases, all other internal medication save that needed to meet complications for the time being. It is entirely unnecessary to enter into an extended consideration of etiology, symptomatology, or unsatisfactory therapeutic experiences of the part in the management of these diseases; sufficient to say that to-day the Garrod philosophy, interpretation, comprehension and treatment of gout, rheumatism and allied disorders is the only conception that can be successfully sustained. In brief, that it is some interference or defect in the metabolic changes which take place in the human economy resulting to the presence of an excess of uric acid, that the alkaline method of treatment is the most effective yet presented.

In a paper recently read by Sir Wm. Roberts before the Royal Medical and Chirurgical Society, we find much light thrown upon the immediate determining cause of this excess of uric acid, and observations of exceeding importance regarding the behavior of the same in the blood and tissues and especially interesting in regard to the phenomena of gout. He demonstrates the fact that uric acid in the blood exists in the form of the *soluble quad-urate*. Under certain conditions, where the alkalinity of the blood be lessened or the excretion of the quad-urate by the kidneys be delayed, the acid combines with the sodium carbonate and forms the bi-urate of sodium, a salt exceedingly insoluble in blood serum. Synovia being less alkaline than the blood, it is suggested, that this may account for the deposit of bi-urate crystals in and about the joints. The immediate effect being to relieve the blood of the excess of acid; this at once becomes consistent with the chemical phenomena observed after an attack of gout. The periodicity of gout is explained by what he terms the process of "maturation," which is the progressive taking up of the quad-urates by the blood and fluids of the body, when finally the point is reached (possibly saturation), when it suddenly breaks up into the bi-urates and precipitates, earlier in the synovial than in the blood tissues. The stage of solution was hastened by increased alkalinity of media; no appreciable effect in retarding the period of maturation and precipitation was produced by this means, and the addition of salts of sodium notably hastened the process. The addition of salts of potassium, lithium or magnesium did not appear to have any effect either way, save the chloride of potassium seemed to prolong the period of maturation. The *factor* in determining the duration of the period of maturation was the

proportion of uric acid, hence the necessity for caution in administering alkalies, which if administered when the blood is near the point of saturation by uric acid, or near the close of the period of maturation, may, by favoring the formation of the urate, precipitate an attack of gout. Taken earlier when the margin of solubility for the uric acid is greater, the alkalies will facilitate the conversion of the acid into the quad-urates and present them for elimination by the kidneys. This accomplished freely, the danger of an attack ceases. It is clear that large quantities of water are needed. From the above it is evident, and the observations tally with experiences in the management of these troubles, that to receive the full benefit of the alkaline treatment, elimination by the kidneys especially is paramount; this absent, then the skin and bowels must be brought into play. The sodium salts are not desirable, and moreover the treatment must be sufficiently prolonged to overcome not only the direct exciting cause, but also possibly delayed, by treatment, the period of saturation.

The above researches also give us valuable suggestions for therapeutics and combinations to meet especial conditions. In the administration of alkalies it would seem proper that we have two formulas, the one for the milder manifestation such as the rheumatic, where apparently, according to Dr. Roberts, the process may be considered the accumulation of the excess of uric acid and delay in its passage into the quad-urate, giving us the inflammatory stage by toxæmia, so to speak, and the other where the process is more fully developed passing into the stage of quad-urate formation with the ultimate precipitation of the bi-urate in crystals and concretions, giving us inflammatory phenomena more directly if not wholly by mechanical effects.

It is beyond controversy that the lithium carbonates or preferably bicarbonates, are of pre-eminent value. In the light of Dr. Roberts' observations it may be suggested that the most easily broken up bi carbonate of lithium, might be, being present in the blood, that as the quad-urates were produced, they would select the former in preference to the carbonate of sodium, thereby producing the soluble urate of lithium, and not the insoluble bi-urate of sodium. In order that the degree of alkalinity be not too pronounced or perniciously hastened, the guarding of the process by the benzoate of lithium, would not only offer more lithium for conversion into the soluble urate of lithium, but by setting the benzoic acid free, would insure the acidity of the excretion, the urine, as well as prevent too much alkalinity of the blood. Hence we find the Lithia-Potash water best adapted for the rheumatic, and the Benzoated Lithium water for gout, rheumatic gout, renal and vesical concretions. It has been our practice to use the latter in all

acute severe rheumatic conditions, until they were controlled, then change for the steady, long continued use to the former, the "Garrod Spa" water. In gout, rheumatic gout, gravel and vesical concretions the benzoated has been of most value until the morbid process was well nigh completely overcome. The formula is follows:

R. Lithium Benzoate, gr., 12.823.
Lithium Bicarbonate, gr., 13,784.
Potassium Bicarbonate, gr., 10.000.
Sodium Chloride, gr., 10.000.
Carbonated Water, ℥xvj. ℥.

The usual dose is one third pint three times a day between meals and at bed time; in severe cases increased to one half pint at same time of day until symptoms are under control; then the former dose.

The "Garrod Spa," named after Dr. Garrod, is the above formula with the lithium benzoate omitted. These formulas are not susceptible of being compounded by simple mixture, but must be produced under pressure and in the nascent state, hence require skill and caution in manufacture.

As indemonstration of their great value and reliability we desire to present the following brief case records for consideration.

Mrs. M.: Mulatto aged 30, was taken with a severe attack of neuralgic rheumatism. Her environment was miserable in every respect. The symptoms were for a time quite puzzling, resembling in many points a case of trichina. At no time was there any synovial inflammation and only at a late stage were the fibrous structure about the joints involved; we were not able to find a voluntary muscle which was not exceedingly sore and tender to touch. Movement was impossible without agonizing pain. Emaciation was rapid and temperature ranged from 101-103°. For three long months did we medicate this patient with alkalies and all other drugs considered of any value, until she and her physician became thoroughly disgusted. Having only attained slight amelioration of her sufferings, finally selected the Garrod Spa (Sander's) on the recommendation of a brother practitioner. In two weeks the symptoms began to abate, in six weeks she was able to walk and in ten weeks she was symptomatically well. This was our first experience with artificial mineral waters, and we were inclined to be a convert. The next case presented occurred in the St. Louis City Hospital under the care of Dr. H. C. Dalton, a woman pregnant, suffering from rheumatism. The following report from Dr. Dalton will suffice.

OFFICE OF CITY HOSPITAL,

H. C. DALTON, M.D, Supt. and Surgeon in Charge.
ST. LOUIS, MO., Oct. 10, 1891.

DR. GEORGE HULBERT, 3026 Pine street :

Dear Doctor.—Your card of yesterday received. Christy S. was admitted to this institution May 22, 1891, suffering from a very acute attack of articular rheumatism. She was in her fifth month of pregnancy.

The rheumatism developed three days prior to her admission to the hospital. I saw her shortly after admission, and found the following condition: Left knee greatly swollen; complained of great pains in right hand and arm, both of which were swollen. A few days after admission, her left wrist and right ankle became greatly swollen and acutely painful.

She was given large doses of salicylate of soda, which gave her but little, if any, relief. The changes were rung upon the various remedies for acute rheumatism without avail. After July 6 she was given a bottle daily of Benzoated Lithium Water (Sander's). In a few days marked improvement was observed. On August 12, patient was free from pain and able to sit up, the swelling having entirely disappeared from her joints. In fact, she expressed herself as feeling entirely well, though still quite weak.

She has not had the slightest symptom of the disease since. On the 3d ult. she was confined, and has done well since. After taking the Benzoated Lithium Water for ten days, the amount administered was increased to a bottle and a half daily.

Very truly yours,

H. C. DALTON.

The next case was that of J. R., aged 35, a telegraph lineman of splendid physique and strength, accustomed to all sorts of hard labor and exposure; is temperate in all things. Had noticed for several months at times that his urine was very high colored, with the brick-dust sediment. He first came to me in January, 1891, complaining of rather severe pains in right lumbar region, which came on suddenly and lasted for about two hours. His urine the day or two before was quite well charged with the brick-dust sediment. The first time of emptying his bladder after the above attack of pain he noticed that it was bloody, and on standing in bottle for a short while, the quantity of blood and mucus would extend half way up the depth of fluid. In a few days this attack passed away under the use of simple medications. Occurring at intervals of two to four weeks, the patient had four more experiences of the above character, except each one was of a decidedly more severe and grave degree, until the last one lasted two weeks, and confined him to his bed. The urine in this attack was to all appearances mostly blood, and, on standing, the entire depth of fluid in bottle was filled with sediment.

From the suddenness of onset of symptoms, the hematuria, the pain, and presence of gravel in the urine, renal calculi were suspected, and it was decided, after making a fair trial of medication and no results were attained, to operate and remove the stone from the kidney. The Benzoated Lithium Water (Sander's) was selected for the trial. Since using this water, one-third pint three times a day, he has not had another attack, nor has there been the slightest indication of gravel in the urine save in September, 1891. Thinking he was all right, he stopped, in August, 1891, the use of the water, and one day in the latter part of September, 1891, had a touch of his old lumbar pain, and noticed his urine was smoky. At once he began again the

use of the Benzoated Lithium Water (Sander's), and is still using it. The presumption is that there is a stone in the pelvis of the kidney which is being slowly dissolved, for otherwise we are at a loss to account for the prompt return of the local symptoms after so long a use of the water, from March to August. The probability is on any other assumption that the stone will be ultimately entirely dissolved.

Experiences, such as prompt relief of attacks of lithiasis, and the numerous concomitant nervous and organic phenomena, have, especially in women, been of frequent occurrence in practice.

The last case we present is that of Mr. N., aged 55 years; a rheumatic for the last fifteen years; occupation as fireman in fire department. Has had repeated attacks of acute articular rheumatism, extending into and involving the structures about joints and tendons to such a degree that the case resembled very closely rheumatoid arthritis. The last attack, and the first in which we saw him, began January 1, 1891, following a very hard night at a large fire. This attack continued with more or less severity up to June 15. He was absolutely confined to his bed, unable to move or bend a foot. There was no regular professional attendance, the patient treating himself by nostrums and etcetera. We first saw him June 18, 1891, and found the man in a miserable state. There was not a joint of his body, save the shoulders and left hip, that he could move; tissues about joints œdematous and thickened; joints more or less ankyloid; skin pale and flabby; muscles soft and relaxed; ankles and all joints of feet immovable, so that toes could not be moved; Carpus and metacarpal joints immovable, and turned to ulnar side; deformities and enlargement of phalangeal joints in both hands; no appetite; continually and freely a sickening, excessively sour-smelling perspiration was present; physically, the man was cowed and despondent.

He was ordered one-half pint of Benzoated Lithium Water (Sander's) three times a day. Diet regulated, bowels kept free, and left with the instructions that in one week he was to report to my office for treatment by static electricity; he was to get there if he had to be carried. In five days his pains had entirely ceased, and he was set up in a rocker; in ten days he was helped down stairs into a carriage and into my office. In one month from day of my first visit he was able to go on duty as night watchman in fire-engine house. This was July 18, 1891, since which time, and up to to-day, he has not lost a single night watch. The sole value claimed for the Benzoated Lithium Water in this case is the relief from pain and further progress of the rheumatic trouble by correcting at once the development and retention of the uric acid in the blood. His remarkable progress in overcoming the re-

sults of the rheumatic inflammation was due to the collateral treatment, static faradization and exhibition of the iodides, as well as the strong mental stimulus of knowing that on July 18, 1891, he must return to duty or lose his place.

Such is the record of experiences and observation which we lay before the reader, and upon which we base our plea for "known and definite quality and quantity in mineral waters." The record is the reason for the faith that is in us. The results attained are our justification in declaring for the honest, scientific, known artificial product, in preference to the dishonest, unscientific, unknown and unreliable so-called *natural* product. The rule, in the use of the latter, is disappointment and failure; in the use of the former, definite, successful results, giving profit and pleasure.

BLENNORRHŒA.

Abstract of Paper read before the Mississippi Valley Medical Association.

BY JAMES J. T. JELKS, M.D.,

OF HOT SPRINGS, ARK.,

Member American Medical Association, Arkansas State Medical Society, Chicago Medical Society, and late Professor of Surgical Diseases of the Genito-Urinary Organs and Venereal Diseases, College of Physicians and Surgeons, Chicago, Illinois.

Ricord's conclusion that gonorrhœa is a non-virulent disease has been relegated to the rear by finding the gonococcus of Neisser. All efforts to produce a blennorrhœa with ordinary pus have failed. Every effort to produce the disease with the discharge of the first stage of the disease where the pus corpuscles are few, succeeds.

The identity of blennorrhœa neonatorum and ordinary gonorrhœal disease has been established.

Neisser demonstrated the gonococcus in 1879.

His conclusions were confirmed in 1880 by Bokai and Finkelstein. These men cultivated the gonococcus and with the pure cultures produced typical urethritis.

Bockhardt in 1883 reported the results of his examinations. In 258 cases he invariably found the gonococcus. He likewise cultivated it and with the culture produced blennorrhœa. Keyser in 64 cases found the same germ.

In 1884 Zwiefel reported that only that pus which contained the gonococcus of Neisser could produce blennorrhœa neonatorum.

Bumm confirmed these statements of Zwiefel.

Sternberg, in 1884, disputed these statements of Bumm, Neisser, Bokai, Finkelstein, Bockhardt, Zwiefel, Willands and many others. With Sternberg we find Sanger, Frankel, Gervanin, M. von Zeisel and Lustgarten, and Mannaberg.

In 1886 Bumm again wrote concerning the coccus of Neisser. In numerous cultivation experiments he demonstrated the presence of this coccus; and with pure cultures of the second and

twentieth generation produced, in two women, typical urethritis and in the discharge was found the gonococcus.

This, then, is a demonstration that urethritis is a specific disease.

This specific disease of the urethra is, in a large majority of cases, limited to the anterior portion of the canal.

When the posterior is involved it should be looked upon as a complication and treated as such by cessation of all treatment of the anterior urethra and rest in bed.

You are all familiar with Fournier's celebrated statement as to the sources of infection; out of 387 cases the disease was acquired from regular prostitutes twelve times; and in 375 cases from clandestine prostitution!

Bumm's experiments with pure cultures in the eyes of rabbits has enabled us to follow the gonococcus in its travels. First they multiply upon the epithelium. In a few days they penetrate this layer of the mucous membrane and henceforth propagate within and upon the papillary layer. This process of subepithelial multiplication of the gonococcus for the first two or three weeks of a blennorrhœa is one of great importance to us; and not until the decline of the disease is this process changed to one of surface multiplication. This is a very important fact for us and explains why all our efforts to jugulate the disease have failed.

It is true that surgeons, years ago, used strong solutions of silver nitrate, 20 to 40 grs. to the oz., to abort the disease, and sometimes succeeded; but when they did it was because this strong remedy destroyed the epithelium and hence reached the coccus beneath it; but the remedy was worse than the disease.

Treatment.—I will not go over all the old remedies and modes of treating blennorrhœa, but call your attention to Prof. Stillings' experiments with Merck's pyoktanin. He used it successfully in blennorrhœa neonatorum. Last winter I heard Dr Hotz read a paper before the Chicago Medical Society giving his experience with pyoktanin in gonorrhœal ophthalmia.

By reason of the fact that pyoktanin penetrates the epithelial covering and into the papillary layer, it occurred to me that this was the remedy for blennorrhœa; and I at once instructed the attending staff in the Genito-Urinary department of the West Side Free Dispensary of Chicago to use it.

Upon my return home I commenced its use in my private practice. Some of the cases have gotten well with marvelous rapidity; a few in 24 to 48 hours. Again, others have gained no benefit from the remedy. I am not able to tell why this should be.

On June 13, 1891, Dr. George Wiley Broome, of St. Louis, Mo., read a paper before the St.

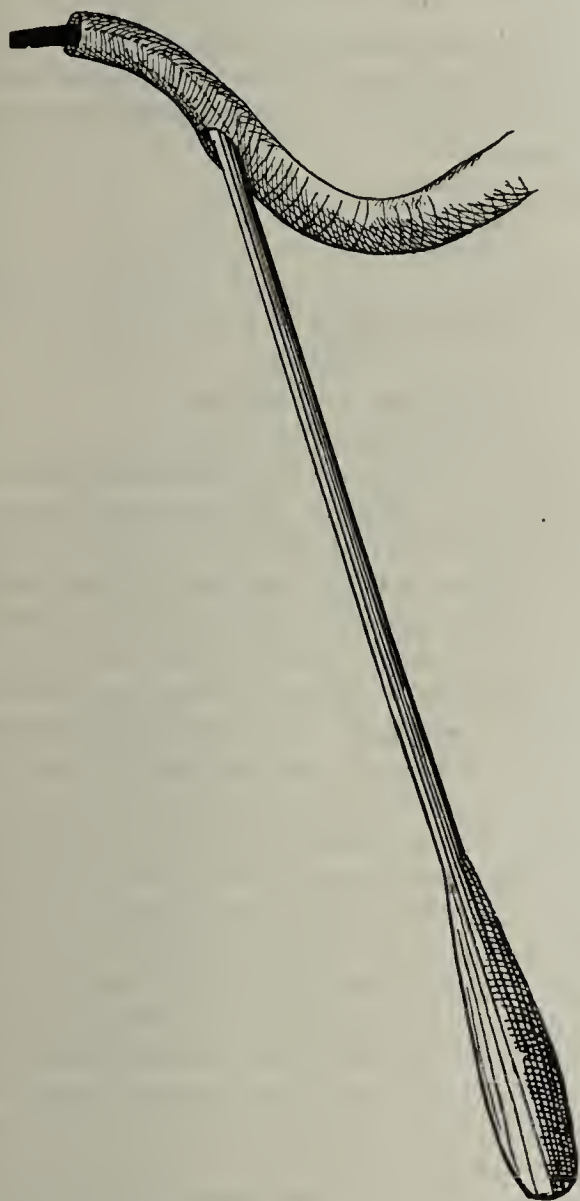
Louis Medical Society, wherein he advocated the use of pyoktanin in blennorrhœa. His method was to insufflate the dry powder. My plan has been to use a saturated solution as an injection, retaining the fluid for five or ten minutes and by pressure forcing it down to the isthmus.

I am sure that the treatment of the future will lie in getting some remedy which has the power of penetrating the tissues and hence reach the disease germs.

NASAL GUIDE FOR THE STOMACH TUBE.

BY L. H. PRINCE, M.D.,
OF BATAVIA, ILL.

The forcible feeding of the insane through the nose with the stomach tube is frequently a most tedious operation, and in many instances becomes an impossibility, and resort is finally had to the



Nasal Guide and Stomach Tube in position for introduction.

use of the mouth-gag, so as to allow of the introduction of the tube through the mouth. As the passing of the tube through the nose, in most cases, is greatly to be preferred, the following is

offered as a simple and efficient method whereby the tube may, in nearly if not quite all cases, be quickly and easily passed through the nasal cavity and into the pharynx.

The instrument used is very similar in appearance to a small-sized urethral sound. It should be about six inches in length over all, and not more than one-eighth of an inch in diameter from the handle to the extremity, the curvature beginning about an inch and one-quarter from the end.

After thoroughly anointing the guide and tube, the point of the guide is inserted into the tube through the fenestra in the side, and passed along until it projects a little beyond the extremity. If the closed-end tube be used, which is not advisable, the point of the guide should fit into the pointed extremity. The tube and guide are then passed together into the nostril, the tube lying above the instrument, the handle of the latter being at first depressed. (See cut.) The tube is managed with one hand, the guide with the other. As the back of the nasal cavity is reached, the handle of the guide is raised, and the tube can then be easily passed down into the œsophagus, the guide being withdrawn as the tube passes over the soft palate.

The proper manipulation of the tube and guide may be easily acquired with a little practice.

CATARACT. HOW SHALL WE DEAL WITH THE CAPSULE? NEW CYSTITOME FORCEPS.

BY EUGENE SMITH, M.D.,

PROFESSOR OF OPHTHALMOLOGY AND OTOTOLOGY IN DETROIT COLLEGE OF MEDICINE; EX-PRESIDENT OF SECTION OF OPHTHALMOLOGY AND OTOTOLOGY, AMERICAN MEDICAL ASSOCIATION; OPHTHALMIC SURGEON TO ST. MARY'S HOSPITAL AND FREE EYE AND EAR INFIRMARY, ETC.

Local anæsthesia (cocaine) and antiseptics have been the means of producing a great revolution in the operation of cataract. Eserine, also, plays a somewhat important part. The Graefe modified linear extraction—linear incision combined with iridectomy—which has been so generally adopted as the operation for cataract, because of its supposed avoidance of iritis and consecutive destruction of the cornea, easier and better healing of the wound, etc., has, with the majority of the leading ophthalmic surgeons of the present day, been supplanted by simple extraction with a small flap (one-third of the cornea, De Wecker), and *without* iridectomy, a near return to the old classical operation, and the success of the operation is as great or greater than the Graefe method, and is in no small measure due to the use of cocaine, and the removal of all kinds of infectious factors which may exist in the conjunctival sac, lachrymal ducts, hands of operator or instruments, cleanliness and antiseptics being regarded as identical.

The adhesion to the Graefe method by some surgeons is no doubt due to a *fear* on their part, which has arisen from the *history* of the flap extraction as made in the olden time, where the flap, as suggested by Daviel, occupied two-thirds of the cornea, and was so frequently followed by suppuration of the cornea, prolapse of the iris, etc. These fears have been dissipated, with many, by statistics and experience, and I predict that ere many months, thanks to the efforts of De Wecker, Knapp, and others, simple flap extraction will be accepted by *all* ophthalmic surgeons as *the* operation, and the iridectomy relegated to exceptional cases, where it properly belongs.

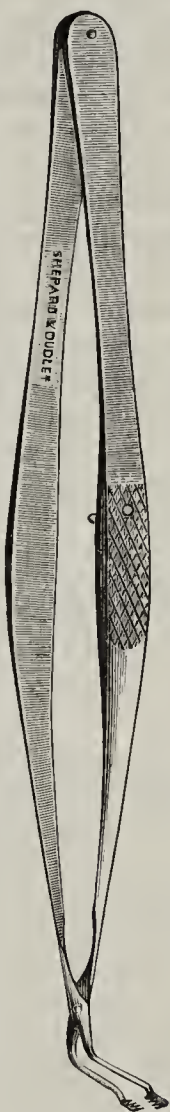
An important step in the operation is the best means of opening the capsule. This feature is exciting the interest of many operators. Shall it be done with the knife while passing through the anterior chamber, before making the counter-puncture, *a la* Galezowski? Shall it be made with the cystitome, in the shape of a T, or peripherally after completing the flap, *a la* Knapp? or shall we, with a pair of cystitome forceps, extract the capsule, *a la* De Wecker, of Paris?

Each method has its advocates, but in my mind, the *beau ideal* method is the *extraction* of the anterior capsule.

With the forceps heretofore in use, this has been a difficult procedure, even in the hands of experienced and dexterous operators, because of the danger of catching a fold of the iris between the blades, and the danger of bruising the flap by the necessary *tilting* of the forceps in order to engage their points in the capsule.

De Wecker, who first suggested removal of the anterior capsule, has forceps made with one or two sharp teeth placed near the points of the blades, but on the *under side* of the blades, after the style of the iris forceps of Leibreich and Mathieu. Knapp modified with more teeth and a slight separation of the blades to prevent catching and bruising a fold of the iris, the points of the sharp teeth being slightly directed downwards or backwards, to better seize the capsule, but owing to the necessity for tilting the blades backward into the pupillary space, their use for this purpose was nearly or quite discarded. Experiencing these difficulties, I sought to overcome them, and have succeeded to my own satisfaction, as I have demonstrated by their use in private, and before my class, in many cases.

My first forceps were simply a modification of Knapps, with four fine, sharp teeth, on one blade



and five on the other. These I further modified by having three teeth and four teeth only, and having *only the points of the teeth* sharp, that they may sink into and *tear*, not *cut*. The principal modification, however, is the curving or dropping downwards of that portion of the ends of the blade which contains the teeth, below the plane of the blades, that the teeth may set down into the pupillary space *without tilting* the forceps. The forceps being introduced closed, as for iridectomy, the end of the forceps is pulled forwards till the curved portion, containing the teeth, is in the pupillary space, when the blades may be allowed to open to their full extent beneath the pupillary border, and by gentle pressure against the lens, the capsule is seized and more or less forcibly (within reason), by a little sudden twitch, extracted. The curve where the teeth are dropped is 1 mm. in depth, the part containing the teeth is 2 mm. long, the blades open automatically 5 mm., and the blades when closed, except that portion containing the teeth, are $1\frac{1}{2}$ mm. apart.

The forceps are most admirably made by Shepherd & Dudley, of New York, and the accompanying wood-cut affords a good general idea of the instrument.

130 Lafayette Ave., Detroit, Mich.

SUBSTITUTION AND ITS ATTENDANT EVILS.

BY JOHN AULDE, M.D.,
OF PHILADELPHIA, PA.

The evils attendant upon substitution and sophistication of remedial agents have long been surmised; they have not, however, until recently, received attention at the hands of the medical profession. Increased diagnostic skill, along with greatly improved facilities for the manufacture of medicaments, favor an approach toward mathematical exactness in computing therapeutic results. When these are wanting we challenge the character of the remedy. The question which presents itself is: Has our patient received the true medicament or a base counterfeit? However attractive in theory, it will be found impractical for the medical profession to drift away from the pharmacists, and it should be our aim to reward the faithful and bring the guilty to punishment. The friendly bond between the two professions should be honesty, as neither can afford to work independently; there is an interdependence which makes them mutually helpful.

It is said of Lawson Tait, that he has returned to first principles, and carries a mill with him, so that when ergot is needed, he prepares it fresh with his own hand. The reliable character of Squibb's ether has been maintained through his business sagacity in having it prepared chemi-

cally pure and distributed all over the world in sealed cans, thus precluding the possibility of sophistication or substitution.

The life of a patient suffering from rheumatism may depend upon his being supplied with sodium salicylate prepared by a combination of Merck's chemically pure bicarbonate of soda and true salicylic acid obtained from oil of wintergreen, and yet few pharmacists, even in large cities, pretend to keep either in stock. They are the exception in Philadelphia, and doubtless the same is true of other cities.

Some years ago Dr. Squibb, of Brooklyn, set his seal on Marchand's peroxide of hydrogen, by endorsing its character and defending its merits as the most powerful and yet harmless bactericide which could be employed in the treatment of various formidable and fatal diseases. Dr. Robert T. Morris, Dr. Paul Gibier, and other well known authorities have corroborated his statements from clinical observation, and as a consequence, a revolution has taken place in our methods of treatment in both medical and surgical practice. The efficacy of this simple remedy, its innocuousness and extended field of application, have shed a flood of light upon modern therapeutics, but at the same time there has followed in its train a host of worthless imitations.

The substitution of the commercial for the medicinal peroxide is calculated to work serious injury and destroy our confidence in a most potent remedy. In the treatment of diphtheria, for example, the commercial product is positively harmful. When death results, shall we blame the attending physician or the unscrupulous druggist who substitutes a base imitation for the genuine product? And still, pharmacists who claim to be respectable, do not hesitate to trifle thus with human life. Is it any wonder then, that our mortality percentages are on the wrong side?

Cascara sagrada has been counterfeited and sophisticated until it is almost impossible to secure a reliable preparation of this most useful medicament, although Parke, Davis & Co., the pioneers in its introduction, have adopted every means in their power for the protection of the medical profession. Antipyrin, a patented preparation, has met with phenomenal sales, and possesses distinct therapeutic properties, and as a result, imitations and substitutes are offered to take its place in medical practice. Whether these imitations are better or worse than the original product, I do not care to discuss; neither is it for the druggist to decide. The decision here, as to any special remedy or preparation, rests entirely with the physician, as he alone is responsible for the condition of his patient; no one else, not even the druggist, should be permitted to interfere with his directions. Substitution is an

evil which should be guarded against; it is an evil which must be eradicated, or the entire medical structure will collapse. It is a duty we owe to ourselves and to our patients to look after this unnatural condition of affairs in which we are so vitally interested, and the time is near at hand when a systematic effort must be made with a view to accomplish the desired end.

This subject is commended to the attention of the American Medical Association, with the suggestion that a committee be appointed who shall recommend suitable measures for the protection of the medical profession from the evils of substitution and sophistication on the part of unscrupulous pharmacists. Shall we have a "list?"

4719 Frankford Avenue.

KANGAROO TENDONS.

[At the annual meeting of the Association of Obstetricians and Gynecologists, held in New York in September, in the discussion upon suture material, Dr. Henry O. Marcy, of Boston, advocated the use of kangaroo tendons, and the interest in the subject is so general, that we reprint the following from the volume of Transactions now in press.]

I take pleasure in exhibiting, at the request of some of the Fellows, samples of kangaroo tendons, in the condition in which they are sent to me from Australia. It will be noted that this animal has the tendon of the tail disposed in a bundle of parallel fibres, running its entire length. These vary in size, dependent upon the size and species of the animal. As will be observed, they are easily separated into even, smooth, round strands of uniform size. Those from the species called the wallabee are preferable, since the size of the tendons is that more commonly desired for the suturing of wounds. They vary somewhat in length, averaging about 20 inches. I have carefully studied the tendons of every animal which I thought could furnish the material suitable for sutures.

The Indian of the Northwest still uses as thread for domestic purposes the fascia lata of the moose, which is sun-dried and maintained dry until wanted for immediate use. It is not unlike the fascia lata of the buffalo, which from time immemorial, until quite recently, has furnished an ample supply. It is almost identical with that of the reindeer of Northern Europe, which is still largely in use there as a suture. Tendons of this character have furnished me, in part, suture material for surgical purposes for the last ten years. They are, however, very inferior to kangaroo tendon sutures. The only other animals which I know that have tendons similarly disposed are the common rat, the squirrel and the opossum.

Dr. C. E. Mastin, of Mobile, sent me recently specimens from the tail of the opossum which

furnish excellent suture material, but they are, unfortunately, only 10 or 12 inches in length.

I sent to Australia more than ten years ago for a supply of tendons from the tail of the kangaroo, inferring from the relationship of the species with the squirrel and opossum, that the tail of this animal should furnish similar tendons, and of course much longer and larger. It has been only after many and repeated efforts that I have been enabled, within two or three years, to secure a supply much in excess of my own immediate requirements. In earlier years I have paid any price demanded, even in Australia, 60 cents per strand, by the hundred. However, an arrangement has been recently effected, by which an ample supply may be obtained for furnishing the entire profession with reliable tendons. They are prepared ready for use, under my own personal supervision, at a cost of \$10 per hundred. These are kept by Messrs. Codman & Shurtleff, the well-known instrument makers of Boston, from whom they can be obtained, or, if preferred, by sending directly to me.

At this price the cost is not much in excess of well selected and properly prepared catgut, to which it is in every way greatly superior.

The tendons are taken from freshly killed animals, are quickly sun-dried, and kept dry until ready for preparation. They are then soaked soft in a sublimate solution (1-1,000), carefully separated, sorted, and quickly dried. They are then immersed in ether for twenty-four hours, although this seems hardly necessary, as they seem to be absolutely free of fat. After this they are chromicized and permanently put up in a solution of carbolic acid (1-10), after the Lister formula for the preparation of catgut. They should be retained in the carbolic oil until required for use, then wrapped in a towel, wrung from a 1-1,000 mercuric solution, for a few minutes, which makes them supple and easy of application. They do not soften and swell as catgut similarly treated. It must, however, be remembered that every precaution of modern surgery is demanded in placing *aseptic* buried sutures *aseptically* in *aseptic* wounds.

I have experimented in the preparation of suture material, in the various ways advocated by a number of authors. I have found none so trustworthy as the chromicized suture, permanently kept in carbolic oil. I quite prefer not to use it until after it has been prepared for six months and it appears to improve with age. In the larger sizes, in well sterilized tissues, it can be demonstrated after three or four weeks, and a marked thickening of the tissues is observed along the line of the buried sutures for a considerable period longer.

Catgut has many defects, chief of which is that, for days together, the intestines of the animals, from which it is made, must remain in a

state of active putrefaction, in order to separate the connective tissue sheath from the other coats of the bowel. This is then subdivided as required in size, and twisted into a thread, the ordinary catgut, or violin strings of commerce.

The sterilization of this material, so as to render it safe for sutures and ligatures, and yet not injure its integrity, is by no means easy. As has been shown by many observers, the larger sizes especially of catgut, prepared for surgical use, contain bacteria capable, under favorable circumstances, of reproduction. This is doubtless the most valid reason why catgut, as suture material, has fallen into disuse.

When its histological elements are investigated, it will be seen that its ultimate fibres cross each other diagonally to the long axis of the bowel. This is an admirable disposition to allow of the ever-varying size of the intestine, but it is little suitable for the purposes of great strength and inelasticity. The illustration is not overdrawn in the comparison of the attempt to make a strong cord by cutting the finest woven fabric upon the diagonal and twisting it. So great is the strength of the connective tissue of animals that catgut, when kept dry, is capable of resisting great strain, as in the high tension of musical instrument strings. But, when macerated, a softening process which must take place in the tissues of the body, the catgut unfolds and becomes a soft, elastic material. This explains why, in the interrupted suture, the knot is so untrustworthy. The tendons proper of animals have their fibres uniformly disposed in parallel lines, and as a consequent, when moist, are many times stronger than the same size of catgut.

Under the most favorable circumstances, sterilized silk sutures disappear far too slowly; and for this reason, if used in any quantity, must generally be applied in a manner to permit of removal. When buried within the tissues, they are more generally encapsuled, rather than absorbed, and often, even after many months, produce irritation and are thrown off as a foreign body.

A properly prepared, aseptic animal suture, buried aseptically in healthy tissues, slowly disappears, and, as histological studies abundantly prove, they are replaced, in large measure, by connective tissue cells, making a band of living, constricting, or supporting structure, which surrounds the included part.

This is of the highest importance in the ligating of large vessels, and of almost equal value in the supporting of many of the structures coapted in wounds, as, for example, in hernia, the repair of the perineum, etc.

I am certain that one of the greatest advances in modern surgery is found in the immediate coaptation of all well vitalized aseptic wounds, hermetically sealed without drainage. For this purpose, the tendon suture is the ideal material,

and I hazard very little in predicting that, at an early date, the clumsy, bungling method of closing wounds with interrupted sutures, at best liable to infection and subsequent danger, will be relegated to history, and the tendon suture will become an indispensable factor in wound treatment.

SOCIETY PROCEEDINGS.

American Electro-Therapeutic Association.

First Annual Meeting of the Electro-Therapeutic Association, held in Philadelphia, September 24, 25 and 26, 1891.

(Continued from page 806.)

FIRST DAY—AFTERNOON SESSION.

Dr. A. D. Rockwell, of New York, then read a paper entitled

ELECTRICITY IN AMERICA,

dealing more especially with the earlier work of his late associate, Dr. Geo. M. Beard, and himself in developing the field of electricity in medicine, and in securing for it professional recognition. He said that twenty-five years ago electricity was but another name for quackery, and to devote especial attention in that direction was a plea of guilty to the grossest ignorance and fraud. As an illustration of this, he referred to the fact that when he first ventured to present for the consideration of the Medical Society of the State of New York a paper on the Medical Use of Electricity, an eminent physician on the committee exclaimed, What! is he regular? The whole subject at this time was a veritable *terra incognita*. Medical journals seldom referred to it in any way; it was not mentioned in our schools, and of American literature along this line there was substantially none. Electricity was known to be of virtue in stimulating muscular contractions, and paralysis was the main, if not the only, disease in which this agent was especially indicated. Abroad, localized electrization had been worked up by Duchenne, Remak and others, and in proportion as their knowledge in regard to the whole matter was limited, in that proportion were most of the followers of these two leaders dogmatic in the assertion of their beliefs.

One party preferred the galvanic and another the faradic current, and a long and unreasonable controversy arose, mainly in reference to the question whether the better therapeutic effect was obtained by applications to the motor points or to the muscles themselves. When, therefore, Dr. Rockwell and his associate, Dr. Beard, asserted and demonstrated that electrization was something more than a mere stimulant; that it was a

tonic of very remarkable efficacy, and as such was indicated in a wide range of diseases associated with debility and impaired nutrition, the medical press here and elsewhere gave to the subject the most careful consideration.

In Germany especially, through the careful *résumé* of Prof. Erb, of Heidelberg, the ideas advanced were received with much interest and appreciation. Dr. Rockwell referred at some length to the methods of general faradization and central galvanization, the revival of the use of static electricity, and the use of electricity in gynecology in this country.

He laid especial stress on the value of electricity in the treatment of extra-uterine pregnancy—a suggestion entirely American, and deprecated the prejudice that decried the method in those early cases where it was applicable, in favor of the knife. He regarded the future of electro-therapeutics as assured, and remarked that the tardy fulfilment of the promises of its youth had been due not so much, perhaps, to the prejudice of men of science, as to the necessary mechanical difficulties in the way of its employment, and to a want of knowledge of the indications for its use and the method of making the applications.

Dr. Morton: If no one is going to say anything, I rise to express the general feeling of pleasure we have in this historical account of electro-therapeutics, of canonizing that period which electro-therapeutics in this country has passed through, and its various manifestations in France and Germany. I recall, at about the same time you speak of, the work of Golding Bird, Wilkes and others. That of Bird of 1840 is still a very remarkable work, and will repay reading by any one. His results were very remarkable.

While on my feet, and although I rose simply in recognition of the great merit of Dr. Rockwell's paper, and acknowledging there is little to go over in his paper, as his statements are very general in their nature, I will in the most courteous nature, say that his placing so much emphasis on general electrization is not what we are after. We want to localize and specify treatments. I see no more reason to attach a particular name to general faradization than to general bathing, or anything which helps health in any way. I think in regard to central galvanism that the reader should be more definite in his statements as to the conditions in which central galvanism is most applicable.

Dr. Blackwood: I have operated on thirteen cases of extra-uterine pregnancy, each of which has been diagnosed by at least one eminent gynecologist. The reason why I prefer faradism, which I use instead of galvanism, is on account of its peculiar action. It acts on the muscular fibre, and it appears to me to be of the same nature as the current in electric lighting. Up to

the last seven months I had no particular proof of my supposition, but as I had always used the faradic current, I have taken special pains to observe its action, and in gaining facts to support my theory. I have some very interesting experiments which I have performed, besides one or two specimens, and I have thirty products of conception, all of which are not more than three months, and so far as my judgment is concerned, I think I am correct as to the mechanical effect of the two currents. That is, the faradic does destroy the integument. I use the faradic current for one hour, and endeavor as far as possible to get the embryo as closely in the embrace of the electrode as possible. After using the faradic I then use the galvanic, 70 to 100 milliamperes. I use galvanism for absorbing the foreign body, as our opponents claim it. I say this without the slightest idea of criticising the gentlemen who have spoken, and in order to combat what may seem adverse criticism, I wish to say that for the last ten years I have obtained the best results from the central treatment, and I think it is the best way to overcome obscure nervous affections. But I often depend on localized treatment as Dr. Morton has claimed, and I think we get good effects from both central and general methods.

Dr. Rockwell: I cannot see why Dr. Morton's remarks apply, I only believe that the doctor has had very little practical experience in following out the methods which I and others have found of the utmost value. Why we should not have a certain name for a certain method, to indicate what it is, I can't see.

Augustin H. Goelet, M.D., read a paper on

THE ACTION AND APPLICATION OF THE FARADIC CURRENT IN GYNECOLOGY.

In presenting the paper, the author said he desired that the discussion would throw more light upon the subject, which was surrounded with much uncertainty and obscurity. The action and application of the faradic current in gynecology was, to his mind, one of the greatest problems of the day in medicine. The literature of the subject was, unfortunately, exceedingly confusing in regard to many important points in connection with this current as derived from the secondary coil. This was regarded as particularly unfortunate, because the faradic current was a therapeutic agent of too much value to be neglected or discarded, as it has been by some of the workers with this agent. He regarded the imperfectly constructed apparatus as the cause of the indifferent results which have been obtained by different experimenters. The construction of secondary coils has heretofore been looked upon as such a matter of indifference by physicians who use them that the manufacturers, having no guide for their construction, have suit-

ed their own convenience in the matter, regardless of any physiological effect to be derived therefrom. In consequence these coils, in the ordinary apparatus, will be found to vary from No. 15 to 26 wire, and from 60 feet to 200 yards in length. Experience had led him to declare that the faradic batteries of ordinary construction are totally inadequate for gynecological work, and satisfactory results cannot be expected from their use. The uncertain statements of manufacturers regarding the length of the wire composing their secondary coils, led him to advise those who desire to be accurate, to measure the resistance of their coils, and calculate the length for themselves, instead of depending upon the statements of the makers. The Englemann battery, with three different secondary coils, he declared to be the only reliable apparatus suitable for gynecological work manufactured in this country. In this the coils are arranged as follows: The secondary coarse wire coil is of No. 16 wire, about 75 yards long; the intermediate is of No. 22 wire, 225 yards long; and the fine wire coil is of No. 32 wire, about 660 yards long. Though these coils were to be regarded as a great improvement upon others, they do not wholly meet the requirements of gynecological work, since very sensitive conditions cannot bear the current from his finest coil. Therefore the following arrangement was suggested, viz.: One spool should contain 1,500 yards of No. 36 wire, which if tapped at 1,000 yards would give two additional coils, one of 1,000 and one of 500 yards in length. Then another coil of No. 32 wire 800 yards long, tapped at 500 yards, would give a coil of that length, one of 300 yards and another of 200 yards. Then another coil of No. 22 wire, 250 yards long, to correspond with Englemann's intermediate. There should also be a coarse wire coil of No. 16 wire, about 100 yards long. By this arrangement practically eight different coils are secured, and a corresponding variation of the current, there being but four spools. It would be possible by this arrangement to treat very sensitive conditions, which could not be approached with the other coils.

Arguments were adduced and experiments given, showing conclusively that there is a marked difference in the effect of the current as derived from coarse and fine wire secondary coils and also in different lengths of the same size wire, which has been denied. The current from the coarse wire coil was declared to be a current of volume or greater ampèrage, as distinguished from that of the fine wire coil, which is a current of tension or greater electro-motive force, the former being useful for muscle stimulation and the latter for nerve sedation. The failure to obtain satisfactory results with this current was attributed to the imperfect and variable construction of apparatus by different manufacturers.

The use of a rheostat or controller in the secondary circuit, it was declared, did not sufficiently vary the physical conditions of this current to make one coil suitable for all purposes, as has been claimed.

The construction of the vibrator or current breaker was regarded by the author as a point of much importance. This device upon the ordinary faradic apparatus produced interruptions entirely too coarse, and the movement is uneven and irregular. He called attention to the fact that for producing sedation from the fine wire coil, a maximum rapidity of interruption should be obtained, and that there should be not 50 or 80, as is usually the case with the ordinary apparatus, but 100 to 200 per second. Coarse interruptions are more stimulating and irritating, and fine interruptions are more sedative. The importance of using coarser vibrations for the coarse wire coil and finer vibrations for the fine wire coil was emphasized. The current from the coarse wire coil is used for muscular stimulation, and that from the fine wire coil for sedation. In applying this current for stimulation for the muscle, it is desired to produce an alternate contraction and relaxation which will resemble the normal physiological action, and the interruptions must be slow, so as to allow the muscles time to respond in a normal manner. That is, sufficient time must be allowed between the interruptions to allow the molecular changes to take place. Slow interruptions permit contraction and relaxations to occur, and the normal physiological action is closely imitated. In effecting sedation, it is desired to paralyze the sensory nerves and wear out and relax the muscles, thus relieving the painful contractions, and the interruptions must be fine. When the interruptions are rapid, the muscles are unable to respond to every vibration, and constant contraction or a tetanoid condition is produced, which eventually wears out their contractile power, and consequently a condition of relaxation is produced if the application is continued long enough. Likewise this constant and intense stimulation of the sensory nerves results in a temporary loss of their power to respond, and a condition of anæsthesia is brought about, which is more or less prolonged according to the duration and frequency of the applications. Attention was called to the fact that sedation was secured by a prolonged application of the current, from ten to twenty minutes. The duration of the application of the current from the coarse wire coil should be limited to five minutes. In all applications where sedation is desired, the strength of the current must be increased very gradually without jerk or shock, and it should be decreased in the same manner.

The effect of the current upon the vaso-motor nerves and the capillary circulation was also referred to, and it was claimed that thereby blood

stasis is relieved, and the absorption of effete products is hastened.

The polarity of the faradic current was insisted upon. Though usually regarded as a to and fro current, it is certainly endowed with polarity, since experiments show that there is a distinct difference in the physiological action of the two poles. This, it was explained, is due to the fact that through the high resistance of the human body, only the break current had a perceptible action, the make current being cut down to such an extent by self-induction as to make its action inappreciable as applied to human tissues. Hence the faradic current, when used upon human structures, may be said to flow in one direction, and is not an alternating but an interrupted current.

Attention was directed to the fact that the best effect of the secondary current is obtained only when the secondary coil completely covers the primary; that is, when the whole of the secondary coil is receiving the full amount of induction. In order to secure this from the beginning of the application, and at the same time make it bearable to the patient, a rheostat or regulator is placed in the battery circuit. This regulator is composed of fine German silver wire, of proper length to afford sufficient resistance to operate six Leclanche cells arranged in series. It is a very simple device which gives the operator perfect control of the current, and allows it to be graduated to suit any case. The increase or decrease of the secondary current is regulated by increasing or diminishing the strength of the current in the battery circuit by means of this regulator, which interposes a variable resistance. The method of operation consists in applying the electrodes with the secondary coil removed from the primary, then allowing just sufficient current to flow through the regulator in the battery circuit to operate the vibrator smoothly but feebly at first, and the secondary coil is then slowly moved up until the primary is completely covered. The strength of the current is still further increased by allowing more current to flow through the rheostat or regulator until the desired intensity is reached. Applied in this way, the very best effect of the secondary current is secured from the beginning of the application, and the most sensitive conditions may be brought under its influence, such conditions as could not possibly be treated in the ordinary manner with the best effect.

The clinical capabilities of the faradic current as derived from properly constructed apparatus, and the therapeutic indications, he thought could be readily inferred from what had been said, and it was, therefore, unnecessary to go into details regarding the respective indications for sedation or muscle stimulation. The different physiological effects of the interrupted induced current as derived from differently constructed coils being

recognized, the way is comparatively clear. It was, however, stated that acute inflammatory process was amenable to treatment by this current under suitable conditions of high tension, as when it is derived from a coil of very fine wire of great length, if a maximum rapidity of interruptions with perfect smoothness is secured, the effect being obtained by restoring the equilibrium of the circulation.

President: Before the discussion on the paper just read, I wish to announce that there will be another meeting to-night at 8 P.M. The paper is now open for discussion.

Dr. Bigelow: It is rather difficult to make a discussion of such an elaborate paper as this. I, in my writings, time and time again, and in a book recently published by me, brought out the distinction between primary and secondary coils, which were first insisted upon by Duchenne and at Apostoli's clinic in Paris. I am not a sufficient physicist or mechanic to go into the physical aspects of the question, for there are such questions. Clinically speaking, there is a very marked, decided and important difference between primary and secondary currents. The current from the secondary in all cases of ovarian troubles is the only current which will be tolerated. I have seen cases of ovaritis, characterized by very persistent and aggravated pain, yield at once to applications of the secondary current. I have seen it aggravated to a degree unbearable by the primary current. I have twice, in some of my experiments lately, seen it yield more rapidly to the static, which is more like the faradic. The feel of the secondary faradic is very pleasant, and from my experience in gynecology, as a sedative it is very marked. It is not used as much as it ought to be, although it is much more used now than formerly.

Englemann, of Germany, has had some remarkable results in the use of this current. It is a much less muscular stimulant than the primary. You do not get any perceptible effects from the secondary coil on the muscular system, so that it seems to me that there should be a distinct and decided difference between the two coils, depending upon the manner of generation, as it is entirely different. With all the facts in these cases before us, in cases of pain in fibroid tumors, and in conditions of intra-uterine fibroids, I think the faradic current is the best.

Dr. Hayd: I am sure that every one has had great pleasure, and has derived very much benefit, from listening to this valuable paper. Those of us who have had clinical experience are satisfied that the faradic current is sedative in its properties, and the question now presents itself, How can we get the sedative properties necessary in our ordinary practice? Those of us who have used the currents with the purpose of getting muscular contractility have found that the

womb does remain contracted permanently. To make this applicable in acute conditions, as in acute reflexes, and where there is extreme sensibility, and where, after one application, so much relief has been given that the woman could go to work and attend to her other duties.

There is one good thing which is suggested to me from Dr. Goelet's paper, and that is this, that the president should appoint a committee of three who are sufficiently qualified to make tests on this subject, to study and observe results, and report at our next meeting their experiences with the differences of the coils, and by that means we will be able to make a standard rule whereby these faradic applications can be made. I do not know that there is any particular difference between the two poles of the faradic battery physiologically; there may be, but I am satisfied we can relieve pain from either pole, whether positive or negative, and whether one has a more sedative property than the other I do not know. The longer I use the fine wire, which I saw used while in Paris, the more I am satisfied the fine wire is capable of giving relief; and yet it is only about 320 yards in length; another was 1,000 yards long. That it would enable us to go into acute conditions where at present I am afraid to go I can't say.

Although I find that it is a great sedative, my experience suggests that it is also capable of doing great mischief. Take it in sub-acute inflammation: I have lighted up inflammations and made great trouble by a weak current of a few minutes' duration. As I speak I recall a young woman of highly nervous organization, delicate fibre, delicate skin, long eyelashes and eyebrows. She complained of some pain, and, on examination, there was tenderness in both inguinal regions. Her temperature was not more than $99\frac{1}{2}$ at any time. After three or four days' treatment with ordinary hot douche and bromide of potassium, I resolved to make an application of the faradic coil. I relieved the pain somewhat, but after a while she suffered a good deal, and that night I made an examination, and I detected a swelling, which gradually increased in size, and there was, at the end of three days, a great mass filling up the posterior cul-de-sac. And I made up my mind I had developed a hematoma.

Dr. Hutchinson: I am exceedingly in favor of the secondary current of Faraday. All I know of the faradic current was learned from Duchenne, and that is probably why I use it, as I adopted his ideas to a large extent. So much do I believe in the secondary current, that I have a large coil of some miles of wire, made so that the primary current can be reached, and the secondary coil is an enormous one. It is tapped at various points, so that it can be increased or diminished in force at will.

I do not find, and I have not found in a good

many years of practical work, as Dr. Goelet says, any difference in the faradic effects of one pole or the other. I do not know of any. I do not get any difference in the effects or in the results even with the use of this great secondary coil. Sometimes I use as much as a mile of wire, and have used more in cases of anæsthesia. I do not find any difference between the poles. What is done in gynecological work I do not know, but that is the practical result of years of use of this great coil, as far as the negative and positive poles are concerned.

I believe that a certain number of feet or yards of wire have a different effect on the circuits through which it connects. There is no question about this. There is none in the induced current. I do not believe it can be made with the utmost force of the great Rhumkorff coil which I use. In the coil which I use you can get a great spark twenty-four or twenty-five inches in length, and that, of course, means great force.

Dr. Von Raitz: I don't exactly understand your paper. Do you intend to produce a secondary current for sedative effect?

Dr. Goelet: Some speakers have misunderstood me. Take a battery where the secondary coil is movable. Dr. Bigelow has spoken of the secondary coil as the primary. In gynecology I seldom use the primary coil, and have alluded only to the two coils above the primary, both being secondary coils, the coarse wires being stimulant and the fine wonderfully sedative.

Dr. Von Raitz: What I have done in gynecology I have tried to get a real basis for. I have applied the currents to the living and dead body, and have analyzed cases as they have presented themselves. From what Dr. Goelet has said, here is no doubt but that the faradic current has an analytic effect on tissue, and if you look for a reaction, the positive pole shows some acid reaction and the negative alkaline reaction. If that is the case, and there is no doubt of it, and if the faradic current is not properly used, much mischief can be done. That is because there is an effect in the faradic current, and it is no play work.

I have had a patient I treated for ovarian abscess and some pelvic adhesions. I wanted to find out what the faradic current would do, and have experimented some time and improved her condition, but not sufficiently, and then I went to the constant current. The faradic primary current has a stimulating effect. The secondary current, the finer the wire and the quicker the vibrations, the greater the analytic and sedative effect. But at the same time the faradic current has an analytic power to a less degree, and in some acute inflammations it should not be used at all.

Dr. Walling: Perhaps some of the effects in

these conditions are due to the rapidity of the vibrations more than to the coil used. That may be so, however. My own experience in using the secondary coil is to throw the whole coil in and take my current from the rheostat, and I have found that this is the better plan. I get better effects from it than I do by attempting to take a part of the coil, for there you get the whole effect of the primary on the secondary, and then you gain more from the rheostat.

As to polarity of current, it has been my custom to distinguish between the two, and I think we get different effects. I am open, however, to conviction on this point. I have found, in many cases, at least, the positive to be more sedative in its character than the negative, yet I believe both will relieve pain.

Dr. Morton: The paper suggests a great many points, and is difficult to discuss, but I will confine myself merely to one or two points which relate to the polarity of currents and the effects of the current according to the lengths of the wires. I wish first to make this point, that there is a good deal of misunderstanding in our talk about the faradic current. We say faradic current, and we don't make plain in that instance whether we are using the interrupted or the alternating current; that is what we should clear up before questioning the difference between the currents. The primary is an interrupted, and we speak of both as alternating currents, and we should make a distinction before giving the subject further discussion, and confine ourselves to the point referred to by the reader of the paper. Is it to make a distinction between primary and secondary currents and finer and coarser wires? I should be very glad if a motion is made directing tests, so that manufacturers could be instructed how to make a standard induction battery, a standard coil, a standard length of wire, and then we would be on a standard basis to begin clinical studies. And that brings me down to what I want to say respecting the different effects, as reported by different observers. There has been the greatest difference in the character and length of the secondary coils. There is our friend from Providence who uses a mighty Rhumkorff coil and gets no polar effects; and there is our friend from New York, with only a short wire, who gets effects. I think they are both right. There is a difference in construction. As Dr. Goelet points out, as you increase the number of coils, you increase the voltage and force. A current which has a section of two, three or six hundred turns is entirely a different matter. As Dr. Gordon says, in his careful measurements, the induction current, the secondary current of the break, measures thirteen times more in intensity than the same current of make. So we see that the make of the primary exerts its entire influence in charging the coil of the secondary. If the

current of the break is thirteen times greater than the current of the make, than one of those impulses is thirteen times stronger than the other. You can see one end of the line will do thirteen times more electrolytic work than the other; but I do not agree with the reader of the paper that the current intensity of the make is not sufficient to penetrate the human tissues. Here is an interesting point. If the electro-motive force of the make secondary is not sufficient to penetrate the human tissues, we are not treating disease by the alternating current at all, but the interrupted current, which gynecological men do not use at all, and it all comes back to this same point, that we must have a standard induction coil. I can go to an instrument maker and have him make me two hundred turns in my secondary coil which will give me an interrupted current, and not an alternating at all, so the whole question simply resolves itself into the construction of the secondary coil, and before any clinical observations are made, which are bound to be contradictory as the mechanisms are different, I think there should be some uniformity as to the kind of machine to be used electrically.

Dr. Waite: Speaking of faradic coils, as Dr. Goelet has remarked, all manufacturers have made them to suit themselves, and they make them to make as much noise as possible. I am inclined to think to get at the proper coil it is necessary first to make a proper primary and then a secondary. The number of vibrations has a great deal to do with the sedative effect of the primary current, for the reason that if you have a slow vibration you only have a small number of impulses, but if it is very rapid you have a large number, and in that way you have as many times more electrical currents as vibrations. It would be a good plan for a number of physicians to investigate the matter and decide upon such a coil as would fit, both in the external dimensions of the primary and the size of the soft iron core, and also the size and length of the secondary coil, and it can be only done by experimentation. There is no rule laid down for making coils.

Dr. Massey: This problem is of a technical character which interests us as practical workers very much. Very little can be done until we get a meter to measure the faradic current, for the whole question at the present time is in much the same condition as was the galvanic current prior to the invention of the milliamperè-meter. You all remember the absurd discussions we heard when we were ignorant as to the relative value of large and small cells and a small and a large number of cells, all of which were buried very deep when the meter was devised. So here I say if we can know what we are talking about we could discuss it intelligently, and we cannot know until we have a meter to measure the faradic current.

The paper of Dr. Goelet was exceedingly interesting and showed a remarkable grasp of the subject. He surprises me very much, however, when he states that he does not use the primary current. That is a current I discarded some years ago when engaged entirely in neurological work, as I could find no difference except weakness as compared with the secondary. Since I have been using the primary current in gynecological practice, where we have low resistance with large poles, I have found it extremely valuable, and this is simply because it is inefficient if the resistance is high. As Dr. Morton has pointed out, it is simply an interrupted current. With it I can get marked contractile effects, in myomas, and I get better contractile effects in the abdominal and intestinal walls than when using the secondary. Large poles with a minimum of resistance are necessary.

The variation between the primary and secondary currents used in this way is extremely remarkable. Patients who feel no contraction from the secondary current can't stand one-quarter part we can give them from the primary—why? Partly at least because it is in one direction, but more because we have greater amperage, and we get more amperage provided we have small external resistances and a coarse wire; for after all the differences of most resistances within the coils would matter little when you have two or three hundred outside of it.

As to the effects of a coarse wire as a secondary coil I must plead ignorance; I have not used it. I think Dr. Goelet may have made a good point against me there; for what a current will do with a mucous surface and low resistance is not to be compared with what it has done with high resistance, as in the skin. This question was at one time decided by me against the claims of a coarse secondary coil on account of a failure of such a coil to send a strong current through small poles and the skin of the forearm. This, I acknowledge, was an insufficient and incorrect experiment. The coarse wire had to be carried almost all of the way over the core to produce the same effect as the secondary did with about one quarter covering the core, doubtless on account of the resistance in the external surface. In spite of the grasp of the subject shown by the reader of the paper and the remarks here, I do not feel that this thing can be decided until we can measure our current. We can learn something from what we do in clinical work, but I do not think it will settle the question to get a standard of anything, as we cannot keep standard cells in order. Such standards will be worthless as exact measures with an actuating cell that varies in power from time to time, and I have not yet found a cell that will not.

Dr. Goelet: Dr. Morton expresses very forcibly my idea in bringing the subject forward a

this meeting. It was that we should have uniformity. If we can do that, we can agree. There is no doubt but that the faradic current, as we employ it to-day, is merely an interrupted and not an alternating current. We do not get the effects of the one-thirteenth which Dr. Morton speaks of, but the effect of the plus, that which is in excess the amount of the break in excess of the make current.

As to the remarks made in regard to measuring the current, I believe that Dr. Wellington Adams has invented an instrument to measure the faradic current—I have not seen it, however,—and if he has made it, it is simply to register the surplus of one of these currents over the other. He is not measuring what effect we are producing on the patient, the amount of voltage or amperage, but merely the excess of the break over the make. Still, I am not familiar with his instrument.

Dr. Walling suggests that there might be a more sedative effect in the rapidity of the interruptions rather than a sedative quality, and I drew attention to that in my paper. The more rapid the interruptions the more sedative the effect.

I have said that the primary was not used in gynecological work, because I have not used it, and I do not know of any one except Dr. Massey who has. It is more contractile. Apostoli does not use it, he always uses the fine or coarse secondary and I took my cue from him.

Dr. Massey spoke of not believing in the difference of effects of the two classes of fine and coarse secondary coils. He found that it produced a similar effect when they covered the primary to a different extent. That is, that the coarse wire coil had to be all the way over the primary in order to get the same effect you do from the fine wire coil. Of course that is so. When you have it covering you have less of volume and little force, and in order to increase the force you must slide more over the primary, you expose it more to the influence of the generating cell; therefore to obtain as nearly the effect from the coarse wire coil as you would from the secondary you slide more over the primary, but you cannot get the same effect where the resistances are equal.

If you apply the two currents to resistances like the skin by small electros, one over the hand and another far away at some indifferent point, your current from the fine wire will produce a better contraction than the coarse, as you have more current. Still if you cut down the resistance in the skin and make it little or nothing, as you do when you take both electros in the hand, or as you do in the vagina, then of course the electro-motive force is not so necessary. You do not get the same muscular contractions as with the coarse wire coil.

Dr. Bigelow said he did not think the secondary coil was used very much; it is not, I wish it was; it is too valuable to be lost sight of, and I think it is because it is so little understood that it is not used more.

Dr. Morton has explained clearly my idea of the difference of high resistance coil, and it is not necessary for me to reply to Dr. Hutchinson's remarks.

Dr. Hayd has made some use of this current foreign to my experience. I have not had sufficient experience to agree with him. He claims that in cases of recent injuries you get better effect from the coarse wire coil than from the fine wire coil. Now in this case of Dr. Hayd, he don't know what injury he has produced before using the current. Perhaps Dr. Englemann may have produced irritation. And he claims, in recent venous engorgement, to get more irritation from the fine wire, and this makes plain the case of Dr. Hayd.

I would say that I would like to have some one make a motion to have a committee appointed to make experiments by those who understand and are willing to make the experiments, and find out what kind of apparatus is used. The apparatus which I used I brought from Paris and find it very satisfactory. And I used it for some time, but I have discarded it on account of its causing so much pain. Since I have been using the rheostat I find it better.

I would want a committee to make experiments and get some standard in order to give the instrument makers, and then we want the same class used on the skin as in gynecological work, where we use the high polarity method; we want to know what we want, and the only way to decide it is by clinical experience, and in the absence of any probability of our getting a meter we can get some experience from clinical work. We want to know which coil has a sedative effect and which not. We can then discard the bad and keep the good.

It is a question to me whether we can register the faradic current with a meter. Will we register the voltage or shall we register the volume or amperage? What do you want to register? Must you have a voltameter?

If a committee be appointed to test these points, coöperation with instrument makers who understand their mechanism better than we do, would be of great value. And as the President has kindly invited me to name a committee including myself, I will mention Drs. Morton, Hutchinson and Massey.

Dr. Morton: I think the electricians will get a standard cell as soon as possible. As for measuring the current, I think they will do that as soon as they know how. As to making the tests, I want to know what the committee is to do?

Dr. Goelett: My idea is if we all work with

the same coils and in the same direction, and if we work with the same ideas, the question would be as I spoke in our clinical work, to test these coils, whether in a private or dispensary practice we agree to a certain form of apparatus for testing and test it in our clinical work.

Motion carried as made.

Dr. L. A. W. Alleman, of Brooklyn, N. Y., read a paper on

THE TREATMENT OF CORNEAL OPACITIES BY GALVANISM.

The employment of the electric current in the treatment of diseases of the eye is not new. Yet our knowledge of the manner in which this agent accomplishes its object, of the indications for its employment, and of the results which may be reasonably expected, is much short of that full and accurate comprehension so much to be desired in the employment of therapeutic agents.

I have endeavored to test thoroughly the efficiency of galvanism, in one class of cases, *i. e.*, opacities, and I invite your attention to a report of my investigations.

After the subsidence of the corneal inflammation which has given rise to the opacity, the eye usually remains for some time in an irritable condition; it flushes easily, and shows evidence of a high vascularity, an increase of nutritive activity in the neighborhood of the scar. Sometimes, vessels are seen running on to the cloudy area; and when this is the case, the prognosis is relatively more favorable.

For some little time the reparative process may go on with much activity, especially in young subjects, the cloud diminishes in density and extent, but more or less quickly, it returns to a condition of normal nutrition; the scar tissue becomes more resistant and the clearing up proceeds more and more slowly, till it finally ceases. In this stage we can often accomplish much by treatment. Such agents as an ointment of the yellow oxide of mercury; calomel dusted into the eye; massage and the like, prolong the reparative process. Sometimes such a radical disturbance as a corneal incision made in performing an iridectomy will favorably influence a case, which has for a long time showed no improvement.

But we finally arrive at a stage where the eye is perfectly quiet and no further absorption of the opaque tissue can be induced.

It occurred to me that in this stage the galvanic current was indicated.

It was a well known fact that it would act as a powerful modifier of nutrition in other parts of the body; why could it not be made to do the same in the cornea?

I believe the reason it had not been more successful, was that when used through the closed

lids, the necessarily feeble current employed on the eye could not produce at the site of the lesion sufficient stimulation to bring about the desired effect, and to meet this indication I had an electrode (I wish to acknowledge my indebtedness to my friend, Mr. W. E. Gibbs, M.E., for his kindly assistance in designing this electrode, and arranging other electrical appliances) constructed which I could use upon the surface of the cornea. It consists of a silver bar, 12 mm. in length, insulated, except at the ends, by a hard rubber shell; the exposed surface at the lower extremity is slightly concave, 7 mm. in diameter. The upper extremity carries a thread which screws into a metal collar, allowing the tips to be changed when necessary. The collar is attached to a copper spring, which still further protects the cornea from injury when the electrode is moved in the fingers, and at the time being perfectly flexible, allows the tip to be adjusted to any desired angle, which greatly assists the convenience of application. The spring is fastened to a hard rubber handle, 10 cm. in length, and 1 cm. in diameter, through which a conducting wire is carried to the binding post, at the upper extremity.

In my first experiments, it was my practice to dip the exposed silver tip of the electrode into a bath of metallic mercury, thereby attaching a globule of mercury to the electrode, which would act as a cushion upon the surface of the cornea; but I have now abandoned this expedient as unnecessary, sufficient moisture being always present, and forming rather a better cushion than the mercury.

A battery of Leclanche cells, a Fleming milliampère-meter and a rheostat complete my outfit. The rheostat is a modification of one made by Mr. Barrett. I have found this instrument extremely sensitive and satisfactory.

I use for an electrode upon the cheek, a carbon disc with a short metal handle, which fits into a hard rubber shell. The disc is covered with moist absorbent cotton, held in place by the shell, and is renewed each time the instrument is used. I have this electrode made with a very short handle, to be less in the way of the operator. I place this electrode upon the cheek on the same side as the eye to be treated.

I apply the cathode to the cornea. Before placing the electrode upon the face, I direct the patient to touch it to the tip of his tongue, as this gives about the same resistance as through the cornea, and adjust my rheostat till I obtain the current I desire to use. This seems a necessary precaution, as the cocaineized cornea might be seriously damaged, without any sensation of pain giving warning.

The eye being previously well cocaineized, I stand behind the patient, whose head is thrown back, and holding the lids well apart with the

thumb and first finger of the left hand, bring the electrode in gentle contact with the cornea.

As a rule, the applications are of three minutes' duration. I usually begin with $\frac{1}{2}$ milliampère from one to two minutes, and gradually increase the strength of the current, and length of the sitting, till 1 to $1\frac{1}{2}$ ma. for three minutes is reached, if the current is well borne.

I have used as strong a current as 3 ma., but the stronger current seems to be no more efficacious, and is very apt to be followed by annoying irritation.

It is desirable to produce with each application just sufficient stimulation to give rise to an increased nutritive activity, and not to overstep the line, and produce destruction of tissue, paralysis of function, and stasis. The condition of a recent scar is reproduced, the conjunctiva becomes injected up to the cornea margin, and fine vessels all seem, during the treatment, running to the scar. This disturbance subsides by the second day, when the treatment is repeated. If the eye becomes irritable, the applications have to be suspended for a time.

The results of this method of treatment are satisfactory in the extreme. The duration of the opacity seems to make little difference in the prognosis. Occasionally an eye is met with which, for no apparent reason, does not bear the current well, and the very mildest treatment is followed by a severe reaction; such cases are rare. The visual results obtained will depend largely upon the position of the cloud. When concentric with the pupil, little improvement is seen till late in the treatment, but when the pupil is covered by the lap of the opacity, the visual improvement is very marked at the outset; this is due to the fact that the scar always clears up from the periphery towards the more dense centre. When the scar vascularizes easily the prognosis is most favorable, however old or dense the opacity may be.

In the small, very white scars sometimes seen in adherent leucomata, it takes a very long time to influence the centre of the opacity, and the patient, who is elated by the marked visual improvement obtained by the first few treatments, becomes discouraged with the much slower progress of the central opacity, but in such cases as have persevered for some time there has been a slow but steady improvement, even in the dense white scars.

I will cite a typical case from a series previously reported:

Case.—Patient, M. F., presented himself at my clinic in the L. I. C. H. Dispensary, May 14, 1891, giving the following history:

Twenty-seven years previously, had lost left eye from an injury. Two months ago, right eye became inflamed and painful. He had evidently suffered at that time from a severe leucomatitis, which

had left a leucoma covering nearly the entire pupillary area. V. $\frac{6}{200}$, not improved by glasses. He was given 1 ma. for one minute at the beginning, gradually increased to three minutes. June 8, after eight treatments, V. had improved up to $\frac{16}{200}$. After some more applications, the current being somewhat increased, 2 ma. for two minutes having been given, vision rose to $\frac{20}{200}$. The eye, which had been somewhat irritable, now became quite severely inflamed, and treatment had to be suspended. The eye had become quiet by August 5, when V. had improved to $\frac{20}{200}$, and by August 27, V. $\frac{20}{70}$ was obtained. Wishing to determine whether or not the treatment was entirely responsible for the improvement, I suspended treatment from this time till October 20, when I found V. $\frac{20}{70}$ as before. Treatment was not again undertaken till February.

After six more applications V. $\frac{20}{50}$ was obtained on March 7, and after eleven more applications, V. $\frac{20}{40}$. The patient received in all three op. average about $1\frac{1}{4}$ ma. for three minutes, and was improved when under treatment from $\frac{6}{200}$ to $\frac{20}{40}$.

Dr. Walling: I have had some experience in treating corneal opacities, and have had most excellent results from the use of the negative current by direct application.

One case I recall to my mind especially, that of a physician who came to me with opacities of the cornea, interfering very much with his vision of one eye. I have no record of the number of treatments. It rapidly cleared up, and his vision is good. He had been treated by some one who had used the positive current, which had lighted up an old inflammatory condition and made it worse. That would seem to be somewhat peculiar. Where there is an inflammatory condition existing, I make application of the positive pole to the outside of the lid, mild in character— $\frac{1}{2}$ to 1 milliampère where it is a chronic condition, then I make application with the negative.

Dr. Massey: I would like to add to my question during the reading of the paper as to what pole the doctor used, that I think the use of the negative pole was wise. To-morrow there will be a discussion on the subject of the transference of metals and other substances into the body by means of the electric current, and in dealing with so delicate a part of the body as the eye, we should remember that the positive pole is disintegrated by the current, and that metallic irritation may result. The doctor's experiments and results are very striking, and will be received by the electro-therapeutic world, and I hope by the ophthalmological world, as an epoch making work in the treatment of opacities of the cornea.

Dr. Alleman: I am now continuing my experiments in place of ophthalmic surgery, and with remarkable results, and I feel that there is a field for electric work in my department.

(To be continued.)

Southern Surgical and Gynecological Association.

*Fourth Annual Meeting, held in Richmond, Va.,
November 10, 11 and 12, 1891.*

(Concluded from page 853.)

Dr. Cornelius Kollock, of Cheraw, S. C., read a paper entitled

OVARIAN CYSTS, WITH THE REPORT OF A CASE OF OVARIOTOMY IN A YOUNG GIRL.

He said that the causes of ovarian cyst seemed to be still a question *sub judice* in the minds of those who are most progressive, and who have made the greatest advancement in the science of gynecology. Various theories have been put forth by those of larger experience, who are earnest seekers after truth, and who are patient investigators of all unnatural and morbid phenomena. But no satisfactory decision has been obtained from all the patient and searching investigations that have been made as to the cause of this singular, unaccountable, and sometimes fatal neoplasm, characterized by histological diversity from the viscus of which it is a production. Some of the theories seemed, at a glance, to be plausible, but, upon close study, we find they will not bear inspection.

Case.—Miss C. L. H., aged 11 years, 8 months and 19 days; general health perfect in every particular. Menstruation first appeared about two months before she was 11 years of age, and continued with perfect regularity, never excessive or scant, nor was it accompanied by the slightest pain. Her physique was fine in every way. Though less than 12 years of age, she weighed 135 pounds; was strong and active. Her breasts were as full and large as those of a woman at 35. She was very handsome, had a fine voice, and sang beautifully. She was very intellectual, and stood at the head in all her classes in a large high school. I saw her for the first time on the 9th of January, 1891. The abdomen was greatly distended, but facies ovariana was not very pronounced. I was confident she had an ovarian cyst, and I rather suspected she had two. On the 16th of January I made a section about three inches below the umbilicus, and removed a cyst from each side, the one on the left weighing 12 pounds, and that on the right 7 pounds. A more prompt and complete recovery the writer had never seen from the simplest operation. Union by first intention took place, and the sutures, silver wire, were removed at the end of the seventh day. In twelve days she was up and about her room, and on the twenty-third day after the operation returned to her home, a distance of 200 miles.

It is now ten months since double ovariectomy was done on this young girl, and there has not been the slightest discharge from her of any

kind. At each menstrual period there is considerable commotion in the pelvic region, attended with some uneasiness in the head and back, but at each period these symptoms decreased, and the last two were accompanied by no pain whatever. The remarkable physical development in this case still continues. It is now ten months since the operation. She has regained six pounds in weight, weighs 141 pounds, and looks better than before she underwent ovariectomy. This young girl came from the purest and healthiest stock of people in this region. Not an individual on either side was ever known to have any constitutional trouble of any kind. Her mother and family physician, both highly intelligent, say they never knew her to be the least indisposed in any way.

NOVEMBER 11, SECOND DAY—MORNING SESSION.

The Association was called to order by the President at 10 A.M.

Prayer was offered by the Rev. Dr. Newton.

Dr. Thomas J. Moore, of Richmond, delivered an eloquent

ADDRESS OF WELCOME.

Dr. William Warren Potter, of Buffalo, N. Y., read a paper entitled

A MEDICO-LEGAL ASPECT TO PELVIC INFLAMMATION,

in which he said that pelvic inflammations in women have been described, discussed and debated from almost every point of view imaginable, until our medical literature is flooded with articles on the subject, and medical society transactions are teeming and bristling with papers pertaining thereto. So far, however, he had not observed that any one had undertaken to discuss these intra-pelvic conditions from a medico-legal standpoint. It was his purpose to discuss that aspect of the question, taking for his text a case that developed an interesting problem in that respect.

After giving a history of the case, Dr. Potter emphasized the following points:

1. The intimate anatomical relations between the pelvic organs and the larger joints of the lower extremities, especially the hip and knee-joints, render them liable to reflexes.
2. The importance of careful diagnosis at the outset, lest grave errors, and possible disastrous consequences, may result from treatment.
3. The medico-legal bearing that errors of judgment in diagnosis and treatment may have in relation to the patient, as well as upon the reputation of the physician.

THE MEDICO-LEGAL ASPECT OF INTESTINAL SURGERY.

Dr. John D. S. Davis, of Birmingham, Ala., read a paper on this subject. He said many

physicians and surgeons, who condemn all mechanical aids for intestinal repair, know not how to use them, never saw them used; refuse to indorse a resection for gunshot or stab wounds, have been known to go in the witness-box for purposes of condemnation and disapproval, when they knew no more about intestinal surgery than a wild Indian about school teaching.

In these days of specialties in medicine, but few general surgeons have either the appreciation, opportunity or disposition to qualify themselves as expert operators in intestinal surgery, but many—to the discredit of the profession, voluntarily appear in the criminal courts of the country pretending to be such—wise and proficient. One of the greatest professional sins of the day is perverted knowledge of conceited ignorance. It is too often that physicians and surgeons weaken and invalidate their opinions to a greater or less degree, by unscrupulous interest in behalf of those employing them, a fact cunningly turned to advantage for defendants in criminal prosecution, and for like reason may become dangerous to the operators they oppose and envy.

To be able to do a laparotomy for stab or gunshot wounds of the intestines, inflicted with murderous intent, and be able to evade civil and criminal liability, the operator must, 1, be able to show evidence of ordinary surgical knowledge in the requirement of the special operation to be performed; 2, he must possess ordinary surgical ability for doing the special operation to be performed; 3, he must exercise ordinary prudence in performing the special operation to be done, as to time, place, antiseptics, asepsis, assistance, nurses, and after-treatment; 4, he must perform the special operation in an ordinarily skilful manner. Hence, to prevent confusion, it will be good, if possible, to determine what constitutes ordinary surgical knowledge, ability, prudence and skill. Upon these depend the whole medico-legal status of the intestinal surgeon, and upon which the expert should be required to depend also. According to the practices and rulings of courts in this country, the word *ordinary*, in its surgical adjectiveness, means that the surgeon shall be capable of and exercise that surgical knowledge, ability, prudence and skill with which a fair proportion of the surgeons of his given locality are endowed, and not that of the highest lights of his profession.

Dr. John A. Wyeth, of New York City, made some remarks on *Ether Anæsthesia*.

Dr. Howard A. Kelly, of Baltimore, Md., followed with a paper entitled *Hand Disinfection*.

Dr. I. S. Stone, of Washington, D. C., read a paper on

THE PEDICLE IN HYSTERECTOMY.

The three principal methods were described

and illustrated by colored drawings, showing the arrangement of the pedicle in the abdominal wound. The author claims a revival of interest in the operation, and that there is need for its frequent performance. The statistics are far better now than ovariectomy claimed after it had become an operation of election, and was firmly planted in public favor.

Particular attention is given by the author to tying off the broad ligaments, and the use of the elastic ligature. Sewing the parietal peritoneum to that of the pedicle, in the extra-peritoneal cases, was also dwelt upon.

The method by ventro fixation has given good results in the author's hands, and serves to accomplish two important purposes, viz.: a speedy convalescence, and avoids the disagreeable sloughing which follows the use of the wire clamp. It may also be used in some cases of short pedicle, where the wire may not easily be applied. The methods were compared and statistics furnished, showing that the extra-peritoneal method with wire and pin gave better results than either of the others. That ventro fixation came next, and the intra-peritoneal method last, with a large mortality. A method of closing the capsule over the stump was described, which the author claimed would answer for either *dropping* it, or sewing in the wound—ventro-fixation. In the latter case, the suspensory sutures are placed and the pedicle sewed in and under the lower end of the abdominal incision. Great care is required in closing the capsule over the raw surfaces of the stump, so that separation may not occur. Owing to the peculiar contractile nature of the capsule, care must be taken to leave sufficient length for approximation of peritoneal surface.

The uterine arteries are to be tied in any case when hæmorrhage is likely to occur, and drainage may be required. Besides reference to methods, the author described the process through which the wound passes subsequent to supra-vaginal hysterectomy.

All myomatous tissue should be removed, which can only be effected, in some cases, by a process of reduction of the pedicle. This is very important, as in the operations where a large amount of myoma is left, more time is required for atrophy and absorption to reduce the pedicle to its proper size. Great danger to the patient is apt to follow, where a broad base of the tumor is left, in either method of treatment, because this mass must be disposed of before the patient entirely recovers.

The author had observed a sufficient number of cases to declare that permanent fixation of the stump to the abdominal wall was the rule, where the extra-abdominal methods were used, and especially when the broad ligaments were cut away to prevent traction.

SECOND DAY—AFTERNOON SESSION.

The Association was called to order by the First Vice-President, Dr. McFadden Gaston, of Atlanta, Ga.

The first thing in order was the ANNUAL ADDRESS of the President, by Dr. L. S. McMurtry, of Louisville, Ky. Dr. McMurtry selected for his subject

A PLEA FOR PROGRESSIVE SURGERY.

He said within fifteen years the entire practice of surgery has been revolutionized. New methods have been introduced and new regions invaded; comparatively recent teachings have become obsolete in practice, and modern treatises recast. The science and art of gynecology, which a few years since was limited to a small and narrow field, has grown into a great branch of medical science and practice. Formerly divided between midwifery and surgery, as a minor branch of one or both, gynecology has become an independent and essential department of the healing art.

When Marion Sims announced through the columns of the *British Medical Journal* that he believed the proper course of treatment in every case of gunshot wound of the abdomen is to open the stomach, search for the bleeding points and secure them, and suture intestinal perforations, he was pronounced by many eminent surgeons to be a dreamer. The suggestion of Sims was most timely, and shortly afterwards Bull successfully executed the operation. For years the treatment of opium in full doses has been pursued, with death in waiting. Now there is scarcely a State in the Union that one or more patients have not been rescued from certain death by prompt resort to operative treatment. He mentioned these circumstances to illustrate and emphasize the point, that surgery is advanced more by the aggressiveness of the surgeon than by timidity. In the face of desperate conditions of disease and injury, where there can be no safety whatever in delay and palliation, the only treatment worthy of consideration is the aggressive course which promises success. Under such conditions the most heroic surgery is conservative, and any other course is not conservative.

Dr. Thomas Addis Emmet, of New York, read a paper entitled

INJURIES TO THE PELVIC FLOOR AND THE METHOD OF REPAIRING THE SAME.

Dr. Joseph Taber Johnson, of Washington, D. C., followed with a paper on

THE GROWTH OF FIBROID TUMORS OF THE UTERUS AFTER THE MENOPAUSE.

He said the object of the paper was to put on record cases and opinions in opposition to this view of this important subject, and to aid in re-

casting our views and in modifying our practice.

He had within the past five years seen at least a dozen women with large growing and troublesome fibroid tumors of the uterus, who were over fifty years of age; some of them over sixty. These women had been assured by their physicians that if they could get along somehow, until after the change of life, their tumors would not only stop growing, but that they would lessen in size, and probably go away altogether; at least, the troublesome and dangerous symptoms would disappear. They had been advised against any radical operation, and encouraged to believe that as they grew older, they would get entirely well. In perhaps the majority of cases this might prove to be very good advice; but the point which the author wishes to make is, that as we are now better acquainted with history and behavior of these tumors, that this is no longer safe advice to give. We cannot assure any woman that her tumor may not prove to be one of the exceptional cases, and that it may not grow more rapidly even after the menopause than it did before, or that it may not present complications equally distressing or disastrous. When from forty to fifty per cent. of women subjected to supra-vaginal hysterectomy died from the effects of the operation, this was very safe and conservative counsel to follow. The possible dangers of the tumor were not equal to the probable dangers of the operation.

The author drew the following conclusions:

1. That the "rule" stated in the text-books, that uterine fibromata cease to grow after the menopause, has many more exceptions than is generally supposed.
2. That *when* they continue to grow after the menopause, they pursue a more disastrous course than before.
3. They more frequently become cystic, calcareous, or have abscesses develop in them.
4. These conditions, requiring operation according to well known rules of surgery, the patients are in a less favorable condition for recovery than before the menopause.
5. If the above conclusions are admitted to be true, it must follow that they furnish additional indications for more frequent and earlier resort to the radical operation.

In the hands of the best operators in cases where a pedicle can be secured, the mortality of supra-vaginal hysterectomy is rapidly approaching that of ovariectomy.

THE SURGICAL TREATMENT OF ANTERIOR DISPLACEMENTS OF THE UTERUS.

Dr. C. A. L. Reed, of Cincinnati, Ohio, read a paper on this subject.

He said anterior displacements of the uterus, when they exist to the pathological degree, are the opprobria of the gynecic art. It is indeed

true that many wombs lean far forward without inducing symptoms, but it is likewise true that many of them that are thus malposed do entail symptoms, objective and subjective, that frequently baffle our resources. It is a misfortune too, that many of all the displacements to which the womb is liable, those in which the organ deviates anteriorly to the normal axis are vastly the more prevalent. Thus in an aggregate of four hundred and ninety-four cases by Nonat, Meadows, Scanzoni, Valleix and Hewitt, quoted by Thomas and Mundè, there were two hundred and ninety-four ante-flexions, and one hundred and eighty retroflexions; while Mundè himself reports two hundred and ninety-four ante-flexions, thirty-three retroflexions and ten latero-flexions in a total of three hundred and thirty-seven cases. As the latter authority is disposed to look upon ante-flexions in minor stages as a physiological (even congenital) condition, it is legitimate to infer that his statistics are based upon observations of displacements in the pathological degree. The conclusion is forced upon us, then, that of all the displacements of the uterus, those of the anterior variety are the more frequent; while the records of practice will force us, likewise, to the conclusion that of all the womb displacements those of the anterior variety are less amenable to treatment than are any of the others.

In the treatment the term *surgical* is employed in contradistinction to any method of treatment by pessaries, tamponnade, or electricity. It may be premised that all surgical methods devised for the relief of these conditions should be directed first, to the removal, when practicable, of the causes of the diseased conditions proper, and, finally, to the readjustment of the diseased organs to the normal physical forces of the pelvis.

In conclusion the author desired the Association to consider:

1. The etiological relationship of contracture of the utero-sacral ligaments to ante-flexion.
2. The possibility of overcoming this condition by such conservative measures as rest, pelvic depletion and appropriate manipulations.
3. The feasibility of removing the obstructive dysmenorrhœa and the sterility usually incident to these cases by the plastic operation which he has described.
4. The inexpediency of forcible dilatation for the relief of these cases and its inability to effect permanent cure.

THE PART THE SHOULDERS PLAY IN PRODUCING LACERATION OF THE PERINEUM, WITH SUGGESTIONS FOR ITS PREVENTION.

This was the title of a paper read by Dr. W. Haggard, of Nashville, Tenn., in which he made the following suggestions:

1. The patient should occupy the left lateral

decubitus, at least during the second stage of labor.

2. Overcome rigidity of the vulvar outlet by the judicious use of chloroform.

3. The presenting part of the child should be supported and not the perineum during the passage of the head and shoulders.

4. Support the head by pressing it well up under the symphysis pubis, by placing the right thumb in the rectum and fingers of the right hand expanded over the occiput.

5. To retard the exit of the shoulders, pressure should be applied to the trunk and shoulder by placing the index and middle fingers of the left hand in the rectum, with the thumb in the vagina to restrain its exit.

6. Support the head and neck by pressure well over the symphysis pubis.

BOOK REVIEWS.

HISTORY OF CIRCUMCISION FROM THE EARLIEST TIMES TO THE PRESENT, with a History of Eunuchism, Hermaphroditism, and the different Operations Practiced on the Prepuce. By P. C. REMONDINO, M.D. Cloth, small 8vo, pp. 346. Philadelphia: F. A. Davis. 1891.

This little book is one that will be welcome not only to the table of the general practitioner on account of its intrinsic worth, but to the medical historiographer on account of the great accumulation of historical facts the author presents, and to the literary class on account of the pleasant style pervading the book throughout. The chapters are as follows: 1. Antiquity of Circumcision. 2. Theories as to the origin of Circumcision. 3. Spread of Circumcision. 4. Circumcision among Savage Tribes. 5. Infibulation, Muzzling, and other curious Practices. 6. Attempts to abolish Circumcision. 7. Miracles and the Holy Prepuce. 8. History of Emasculation, Castration and Eunuchism. 9. Philosophical considerations relating to Eunuchism and Medicine. 10. Hermaphroditism and Hypospadias. 11. Religio Medici. 12. Hebraic Circumcision. 13. Mezizah, the fourth or objectionable act of Suction. 14. What are the benefits of Circumcision? 15. Predisposition to and Exemption and Immunity from Disease. 16. The Prepuce, Syphilis and Phthisis. 17. Some Reasons for being Circumcised. 18. The Prepuce as an Outlaw, and its effects on the Glans.

The six remaining chapters discuss the relations of the prepuce to phimosis, cancer, gangrene of penis, calculi, reflex neuroses and dysuria, enuresis and retention.

Our author makes out a very strong *ex parte* case against the prepuce, and whether accepting his conclusions or rejecting them, one can but admire the author's ingenious presentation of his case.

COMPARATIVE ANATOMY OF THE DOMESTICATED ANIMALS. By A. CHANVEAU, M.D., LL.D. Translated and edited by GEO. FLEMING, C.B., LL.D. Second English edition. New York: D. Appleton & Co.

For the medical man who is so practical that he ab-

juries all literature that is not an every day necessity, Chauveau's work has no charm. The student of natural history and of biology, however, finds this work a most valuable addition to his library. To the teacher of anatomy it is,—or should be—indispensable. Very few works on human anatomy are so beautifully illustrated and pleasantly written as is this treatise on comparative anatomy. The generalization of the various topics are excellent, and the specialized descriptions of the various structures are well worthy of imitation by compilers of anatomies of the human subject. That Chauveau's work is the best for students of veterinary medicine goes without the saying. Indeed there is practically no competition in this field, Chauveau being generally accepted as filling the want completely.

BACTERIA AND THEIR PRODUCTS. By G. SIMS WOODHEAD, M.D. (Edin.), Director of the Laboratories of the Conjoint Board of the Royal Colleges of Physicians (Lond.) and Surgeons (Eng.), etc. New York: Scribner and Welford, 1891. 12 mo, pp. 459. Price \$1.25.

This book has been upon our study table for some two months, during which time we have had frequent occasion to refer to it, and always with satisfaction. The ground covered by the work includes a history of microorganisms; fermentation; the bacteria of certain special diseases, cholera, typhoid fever, tuberculosis, leprosy, anthrax, tetanus, diphtheria, etc.; vaccination; bacteria in air, earth, and water. A single chapter is devoted to the chemical products of bacteria. The book treats of philosophical and applied bacteriology, rather than technique, and cannot fail to prove useful to the practitioner.

THE URINE, THE COMMON POISONS, AND THE MILK. Memoranda, chemical and microscopical for Laboratory use. By J. W. HOLLAND, M.D., Professor of Medical Chemistry and Toxicology, Jefferson Medical College of Philadelphia. Illustrated. Fourth edition, revised and enlarged. Philadelphia: P. Blakiston, Son & Co., 1891.

This well known text-book, as its title indicates, is intended for laboratory use. Teachers engaged in the difficult task of teaching chemistry to medical students, would do well to carefully examine this book, with reference to its use with their own classes.

ORIGIN, PURPOSE, AND DESTINY OF MAN, OR PHILOSOPHY OF THE THREE ETHERS. By WM. THORNTON. Boston: Published by the Author, 1891.

As an example of the author's philosophy, the following may be given. After reciting a long list of articles of the *materia medica*, which are not found in the body, and which include such substances as opium, mercury, arsenic, colchicum, digitalis, iodoform, and nuxvomica, he says: "If such materials as the above list contains are never found in the body, they should never be used in the different forms of sickness for which they are now prescribed." This occurs in the chapter entitled "How to make Medicine a Science." The book is worthless.

PHYSICAL DIAGNOSIS. By JAMES TYSON, M.D.

This is a convenient manual that is well worthy of a place in every student's library. It is concise, yet suffi-

ciently elaborate for all ordinary purposes, and pertains only to diseases of the chest.

THE MEDICAL NEWS VISITING LIST FOR 1892.

Weekly (dated, for 30 patients); Monthly (undated, for 120 patients per month); Perpetual (undated, for 30 patients weekly per year), and Perpetual (undated, for 60 patients weekly per year). The first three styles contain 32 pages of data and 176 pages of blanks. The 60 Patient Perpetual consists of 256 pages of blanks. Each style in one wallet-shaped book, pocket, pencil, rubber, and catheter scale, etc. Seal grain leather, \$1.25. Philadelphia: Lea Brothers & Co. 1891.

THE CHICAGO EXHIBITION.—The energetic manner with which the preparations for the Chicago Universal Exhibition have been pushed forward, not only in America, but in England and other countries, gives promise of great success. We are glad to note that an English Royal Commission has been appointed, and that its representatives (Mr. James Dredge and Sir Henry Trueman Wood) have been over to Chicago and satisfactorily concluded all necessary arrangements for the participation of the English exhibitors. From the medical and sanitary point of view the exhibition will certainly prove of great interest. In the first place, the organizers are particularly anxious it should be thoroughly understood that the exhibition is not merely a commercial undertaking. On the contrary, every endeavour will be made to bring together collections of a purely scientific character. There will also be a great number of international scientific congresses, which will commence in May and continue till November. A large building destined ultimately to become an art museum, is to be erected on the lake front. In the meanwhile, the exhibition executive have offered to pay part of the cost for its erection, so that they may use it during the exhibition as a meeting place for congresses. It is anticipated that the congresses will attract so many people that provision has been made for overflow meetings. The auditorium theatre will be reserved for such emergencies, and it is large enough to hold 10,000 persons. The gathering together of so large a number of people will of itself involve many important administrative and sanitary problems. There will be at the exhibition practical experiments and tests of drainage and of the disposal of sewage. The water mains are now being laid down, and these will supply daily from forty to fifty million gallons of water available for drainage, fires, etc. But, apart from this, pipes are being laid, some of them for a distance of ninety miles, to bring pure mineral spring waters to the exhibition for drinking purposes. In looking over the list of the 172 groups into which the objects to be exhibited are classified, many among them will be found of direct interest to the medical profession. Indirectly, America, as the granary of the world, has much to show affecting food supply. It is to America that we are mainly indebted for the cheapness of food in England, and on this cheapness public health in a measure depends. All that concerns the storing, tinning, preserving and transporting of meat, fish, and corn from America is of great practical importance, and never will there be probably a better opportunity of studying these problems than that which the Chicago Exhibition is certain to afford.—*London Lancet*.

AT THE last meeting of the Board of Directors of the New York Post Graduate Medical School and Hospital, J. West Roosevelt, M.D., was unanimously elected Professor of Clinical Medicine.

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SATURDAY, DECEMBER 5, 1891.

THE RESPONSIBILITY OF MEDICAL TEACHERS
AND WRITERS.

A caustic article from the pen of Dr. W. H. LINK, of Petersburg, Ind., in a recent number of the *American Gynecological Journal*, calls attention to what he considers some of the abuses in medical teaching. He is particularly incensed at the promotion to professorial positions of men whose principal merit lies in the possession of money, or medico-political influence, or because they have written a book.

Perhaps no one can so fully appreciate the difficulties of a teacher's position as a teacher himself, but the effects of his teaching, as felt by the taught, may also with propriety be brought to his attention. It is certain that many men are willing to make oral statements before a class of undergraduates, which they would not be willing to publish and have subjected to the more unbiased and discerning criticism of their fellow practitioners. Particularly do some gentlemen teach diagnosis much more dogmatically and with show of certainty in the lecture room, than they would care to exercise it at the bedside. The difficulties of practice as met by the young practitioner, are so different from what in many instances he has been led to expect, that a revulsion of feeling toward his teacher, very frequently unjust, and loss of confidence in him takes place, which is not

to be wondered at. This puts upon the teacher the responsibility of giving to his students the best which the profession as a whole has accepted, the latest which the energy of investigators has produced, together with such comments as his individual experience may dictate, but let it be understood that such comments are personal, and not, therefore, authoritative. Brilliancy should give place to the real. These students are soon to put into serious use the lessons taught them, and without the balancing guide which experience alone can give.

More to be dreaded than the careless teacher, is the reckless writer. In these days of numerous medical journals, many of them crying for matter, many essays are printed which do but small credit to their authors. The dangerous papers, however, are those which are written by clever men and good writers, principally for advertising purposes, and which appear in some of the best journals. Papers which are intended principally to show the ease with which the writer can perform a certain operation, and which represent as free from danger some questionable procedure, often fail of their original object, but do succeed in making unqualified men undertake work which they had far better have left alone. The honest practitioner, looking for assistance in his work, and misled by the reputation and official standing of the writer, takes his implied advice and does damage. Ultra-conservative suggestions from men prominent in the profession may also lead to baneful results.

A greater responsibility lies upon the writers of books, because of the greater weight usually attributed to them. So long however, as the writing of a book shall be regarded as the best indorsement for a professional position, or for high standing in the profession, so long shall we find books, thrown together from materials found in a convenient library, novel perhaps as to style and arrangement, but representing the opinions of others rather than the knowledge of the author; devoid of originality. Incalculable is the damage done by such books among conscientious workers who look to writers for assistance in times of trouble. It is not always, perhaps we might say, it is not often the book which contains the greatest number of references which is the most valuable. Mere erudition without the leaven of originality and experience, is heavy

and valueless. As a type of a most excellent book, we would mention BRINTON, *On Diseases of the Stomach*. This work is replete with facts, carefully determined individually by the author; is a veritable mine of information, and may be accepted as a model monograph.

Perfection in books is not to be expected, nor agreement in opinion with everybody, but books which are made to sell, or books which are written with some other reason than to instruct, can usually be detected, and should be plainly stamped for what they are worth. This throws some responsibility upon reviewers. Every book accepted for review, is entitled to a sufficient study to determine its value. In many cases this can be done easily and quickly. Reviews should be considered as made not so much for the benefit of authors and publishers as for the guidance of buyers. Indiscriminate praising of all books reacts against meritorious works, and assists in the sale of many books which should fall flat. From a perusal of many book notices it would seem that many reviewers believe that an extract from a book's preface is the best possible review of it.

The practice is to be denounced of condemning a book on such minor grounds as grammatical errors, or statements so gross as to be evident slips of the pen, and unlikely to mislead any one, while at the same time failing to call attention to its valuable parts. But the duty of the reviewer is plain, to stamp as spurious all books which bear the marks of having been written for personal ends only.

Let our teachers and writers feel the responsibilities which rest on them and weigh well their views before giving them to their brethren.

SECTION WORK.

With this issue of *THE JOURNAL* there is a practical completion of the work of publishing the proceedings of the late meeting of the American Medical Association at Washington. The work has been as methodically done as the matter in hand would permit, and being off with the old we are now on with the new.

Already the officers of the several Sections are engaged in securing the right men for special lines in their several departments, and we are informed that their success betokens the next as

the grandest meeting in the entire history of the Association. This sounds very loud to those who were at Cincinnati, Nashville and Washington, but all the same, the winds that whisper the words so softly in our ears, are harbingers whose voices may be relied upon as telling only the truth, the whole truth and nothing but the truth, and if you are inclined to be the least bit skeptical, begin to think of your visit to Detroit next June not only for the purpose of verifying our statement, but to be mentally, physically and professionally refreshed.

At the late meeting in Washington, the Association declared its wish to have a complete stenographic report made of not only the general meetings, but also of each of the Sections, so that there was fair and sufficient warning given that whatever a member gets on his feet and says out loud will be written down. The discussions will all be reported, and the stenographers will, at the close of each day's session, hand over to the Section officers their notes. The Section officers will put them in form for publication, first winnowing the chaff from the wheat, so that there may be a gathering of material that will fairly reflect the progress of our art during the current year.

Three chairmen of Sections inform us that their programs are practically complete, but of course are held open for amendment. We are pleased to make a note of this, because of its indication of an enthusiasm in their work that is highly commendable. These chairmen know just what they are about, in assigning lines of thought for development to the men who are already known for their professional achievements in particular directions.

Furthermore, these same chairmen tell us they are making special efforts at securing the best known men to take leading parts in the discussions. This is for the purpose of bringing out a careful expression of opinion that is pertinent to subjects of which such men are conceded to be masters, or very diligent students.

While we fully appreciate the value of a carefully prepared paper by a good reasoner, it is the commonest thing that happens at a society meeting, for a paper that has not much in it, to develop a discussion of the utmost value. Discussions should be and usually are the life, body and soul of the meetings.

METALLIC BODY EXTRACTED FROM THE VITREOUS BY THE ELECTRO-MAGNET.

In the September number of the *Australian Medical Gazette* DR. BARRETT reports a case in which the electro-magnet was successfully used to remove a chip of iron from the vitreous chamber. The patient, a male aged 21 years, while using a hammer, felt something fly into his eye, penetrating the cornea. When seen by his physician, a day or more afterwards, there was evidence of a corneal wound and the crystalline lens was seen to be swollen and opaque. After a few days had been allowed to pass, and the lens had softened sufficiently to favor its evacuation, an operation for its incision was performed. During this procedure, a wave of vitreous humor passed into the anterior chamber and through the operation wound. The foreign body escaped into the anterior chamber also, and thence it was promptly extracted by the magnet. The patient did well ultimately, his vision being $\frac{6}{18}$ C + 13 D., a result which has not been surpassed in any recent similar case that has passed under our notice.

DOMESTIC CORRESPONDENCE.

Etiology of Scarlet Fever.

Journal of A.M.A.—Dear Sir: In your last issue you say you will take pleasure in publishing communications on cases like the following, and as it will probably be of some value in the etiology of scarlet fever, I will report it. Six weeks ago yesterday Chattie Myers, aged 10 years, went to Morley, a village four miles from this place and was in a room for an hour in which another little girl was suffering with scarlet fever. The little girl had been sick three days. Chattie came home and just two weeks afterwards was taken down with the disease, was quite sick and is now just about through the shedding process; her parents have kept the different portions of skin and have handsful of it in the shape of fingers, toes, etc., and during this week Chattie is bloated and threatened with a severe attack of uremia. So there is no doubt in my mind that scarlet fever is contagious during the first few days, but it has not proven *very* contagious (in this locality) as it has not spread at all in this community. There were two cases here last winter and no effort made to keep it from spreading, but it did not do so. It seems to me that in an intensely malarial district scarlet fever, diphtheria and typhoid fever lose their extreme virulence.

At Charleston, a town of 1,500 inhabitants, they have recently had an epidemic of diphtheria, and only one child died, and it was an unhealthy child before it was attacked. Within the last few years there have been sev-

eral cases of scarlet fever in this and Mississippi county, but people are not uneasy when a case is reported. As to treatment and management of either one of the above named diseases, there is rarely anything done in the way of isolation or to prevent neighbors from visiting and sitting up with the sick. So your advice as to quarantine is of no value here. I recollect on one occasion a gentleman from Tennessee came to Charleston and his son was taken down with scarlet fever, and the father allowed his other children to go around and play upon the streets, and the citizens became so incensed that they talked of mobbing him, but later in the season the scare was over and there was no more comment upon a case of scarlet fever than there was of one of intermittent fever. There is some influence that is of benefit to the Swamp Doctor. Either the malaria helps him in his treatment or calomel, quinine and opium are three mighty good remedies in scarlet fever. We hardly ever know what we are treating until half the neighborhood have been exposed, and then if the case is mild, which is generally the case, we call it "scarlet rash," which the laity thinks is not contagious or dangerous. After the patient begins to lose his scarf skin and probably has a convulsion from uremic poisoning, we tell the people that it is genuine scarlet fever and they had better keep the neighbors away.

Oran, Mo., Nov. 23.

Respectfully,

W. P. HOWLE, M.D.

SELECTIONS.

COMPRESSED MEDICINE TO BE USED HEREAFTER IN THE ARMY AND NAVY.—Army and Navy officers, and particularly those of the medical branches, evince great interest in a contract which was awarded at the War Department for a new system of carrying medical and surgical supplies for an army. Ever since the last Sioux campaign, there has been a growing demand for a plan by which supplies needed by the surgeons could be placed in a more compact form than liquid, and carried with greater safety and economy. The result of to day's award is believed to be as near perfection as possible.

In a small, light wooden chest, 23 inches long, 14½ inches wide and 17¾ inches high, are sixty square bottles, containing as many different kinds of medicine, but in compressed tablet form, none of them being larger than an ordinary peppermint lozenge. One of these lozenges or tablets contains all the necessary ingredients of a famous liniment, and when dissolved in an ounce of distilled water its healing properties are the same as if it was in liquid shape and in a big glass jar. Some idea may be formed of the perfection to which the art of compression has been brought, by the fact that if the contents of this small brass-bound chest were liquefied and in their customary jars and bottles, they would occupy nearly one-half of the space of a regular freight car.

There are two of these chests to be supplied to each battalion of 200 men. No. 1 is marked with the Geneva Red Cross and inscribed "Medical Supply Chest," while the only difference in No. 2, so far as outward appearance is concerned, is the inscription, "Surgical Supplies." With certain kinds of medicine, like cough mixture, used in quantities, a bottle holding a gill of the compressed tablets is equivalent to a gallon of liquid, and should the bottle break, the merits of the tablet are not impaired in the least.

Contract was awarded for 200 of these chests, and one of each kind is to be placed under the driver's seat of an ordinary ambulance, or in case of field service and when pack-mules have to be utilized, the chests are suspended on each side of the pannier, their weight with contents being but 85 lbs. each. On the top of each bottle-stopper is the name of its contents, and fixed securely in the lid of each chest is a list of its contents, for the information of the surgeon or hospital steward in charge. Surgeon J. C. Merrill, of the Surgeon-General's office, who has been supervising and conducting the experiments, declares that the new system will revolutionize the mode of supplying needed articles for an army, and will be of value as well to the National Guard organizations of the various States. Iowa is already in the field with inquiries on the subject of these chests, and it is quite likely that at the next annual encampment of the troops of the Hawkeye State, these necessary medical and surgical adjuncts will be seen in abundance.

Whisky, brandy, alcohol and castor oil are carried in liquid form, their ingredients rendering it impossible to form them into tablets, but cod-liver oil is compressed. In making the investigations, the English army system of carrying medical supplies was examined, but while lightness was obtained by means of wicker baskets covered with rawhide, it was demonstrated that if the hide became dampened it would twist in all shapes, and destroy the bottles which the wicker baskets were filled with. Hence a light wooden chest was determined upon, and a New York firm provided what proved to be the best and most attractive-looking model. It was accordingly awarded the contract. — Washington Special to *Chicago Tribune*.

THE PORO-PLASTIC FELT JACKET, FOR SPINAL TROUBLES.¹—I do not propose to indulge here in a lengthy dissertation upon the etiology and pathology of spondylitis, or Potts' disease, but will present a few facts based upon an actual experience in the surgical and mechanical treatment of that distressing malady, as well as of lateral curvature of the spine.

The advantages of the poro-plastic felt over plaster-of-Paris and other suggested agents as a material for spinal jackets are many. Its most prominent claims for superiority are its *lightness*, its *sporsity* and its *resisting power*. The weight of a spinal jacket made of this material for an adult is only one-fourth of that of the plaster-of-Paris jacket for the same patient. This is a point strongly in its favor when we remember how delicate are those persons who have to wear such an appliance.

That poro-plastic felt is the most highly porous material yet suggested for a spinal jacket no one who has taken the trouble to investigate the matter will deny. While our most eminent American orthopædist claims that a plaster-of-Paris jacket is quite porous, I must say that I have failed to discover any porosity in such a jacket when made in accordance with that eminent gentleman's instructions. The amount of air likely to pass through a half dozen consecutive layers of a plaster jacket, with an abundance of extra plaster rubbed thoroughly into every pore or mesh of the cloth employed in its construction, is certainly reduced to a minimum, if there be any at all. The amount of support or resistance in the poro-plastic felt can be increased at will by simply multiplying its layers where such support is desired.

The poro-plastic felt adjusts itself to every irregularity of the parts with the greatest precision and nicety, while its elasticity permits free and unimpaired respiration—important points when the comfort of the patient is taken into account.

Before proceeding with a description of the mode of preparing a spinal jacket, I desire to refer briefly to two important points in the diagnosis of Potts' disease—not for the benefit of the orthopædic specialist, but for the guidance of the general practitioner under whose observation such cases usually first come. The two diseases with which it is most likely to be confounded are lumbago and anæmia, or congestion of the spinal cord. This confusion results in much delay in the beginning of the proper treatment of the trouble.

The prominent diagnostic symptoms in Potts' disease just referred to are pain at a given point along the spinal cord, which is relieved by catching the patient under both arms and lifting him up to a point of complete suspension, and the peculiar gait noticed in the early stages of the disease, when the patient walks with a cat-like tread upon the balls of the feet, and avoids throwing any weight suddenly upon the heels.

The mode of preparing the poro-plastic jacket is simple enough to popularize it with physicians, even in the most remote sections of the country. The first step in the manufacture of a felt jacket is to make an accurately fitting plaster-of-Paris jacket. This is done in the usual manner, the patient is suspended according to Sayre's method, and the jacket is made over a thin, closely-fitting shirt of gauze or other light material. The width of the plaster bandages to be employed must be determined by the size of the patient. If he be an adult, well developed, a three inch bandage should be used; if a child, a two or two and a half inch bandage is the proper width. Of the width chosen, six 5-yard bandages will be required. Only two of these should be placed in the water at a time, the remainder to be put in by an assistant two at a time as the work proceeds. A bandage is ready for use when the water in which it has been submerged ceases to bubble or effervesce. The first circular layer of the bandage should pass around the hips at least two and a half inches below the crest of the ilia, so as to secure a liable basis of support for the superstructure. The lower half of the jacket should be allowed to "set" or harden sufficiently to sustain the upper half, and thus prevent sagging near the center. Always let the jacket extend well up into the axilla. We must rely mainly upon the hips and chest walls for our points of support.

When the entire jacket has hardened sufficiently we divide it in front along the median line from the top downwards with a strong, sharp knife. Instead of guiding the knife with fingers of the left hand, I follow a groove in a piece of zinc previously placed in position under the gauze shirt, corresponding with the median line and extending from the sternum well down on to the pubes. This zinc strip is two inches wide, and has a groove extending through the centre from end to end,

After the jacket (including shirt) is removed, its cut edges should be immediately brought together and held in apposition by a bandage passed repeatedly around it, and then allowed to become thoroughly dry by exposure in the sun or on a stove or range. The plaster jacket thus completed serves as a mould for making a cast of the body. This cast is made by filling the jacket or mould with plaster-of-Paris mixed with water, of the consistency of wheaten dough. A cylinder of wood or metal should be set in the middle of the mould, equidistant from all sides, so as to leave a hollow opening through the finished cast for convenience in handling, etc. Over this cast the felt, previously softened by immersion in hot water, is laid and allowed to harden, care being taken to rub down and smooth out all wrinkles and irregularities. When this has become thoroughly hardened, it is removed from the cast, and then becomes itself a cast for the addition of any extra layers that may be desired for the purpose of increasing its strength at any point necessary. These extra pieces or parts after being properly fitted, are riveted on to the first or main layer of the felt. The corset is now trimmed, the edges are bound with soft leather or sheep

¹ Read at the Meeting of the Mississippi Valley Medical Association, St. Louis, Mo., Oct. 14, 1891, by Ferdinand King, M.D., of New York.

skin, and a row of hook-eyelets put on either edge in front for the laces that secure it firmly in position on the patient. If additional strength is desired on either side of the corset, it may be secured by steel strips placed transversely between the layers of felt and held in position by small rivets. If the spondylitis be located in the cervical portion of the spinal column, thus necessitating the use of the jury-mast, the latter may be riveted on to the upper part of the felt jacket. Likewise a leg splint or brace for hip-joint trouble may be riveted on the lateral lower border. The solidity of the felt assures solid support in either case.

As stated at the outset the poro-plastic felt is exceedingly porous, permitting free ingress and egress of the air as well as the free escape of skin excretions from the body. Even greater ventilation may be secured by inserting shoe-eyelets distributed over the surface of the jacket at such points as may be desired. These eyelets will add to, rather than detract from, the strength of the appliance, thus serving a double purpose.

As a general rule the jacket is fastened in front by ordinary corset lacings, but if the greatest possible space for the expansion of the chest walls is desired, as is usually the case in treating lateral curvature, elastic lacings may be employed.

In conclusion I would urge upon the profession the importance of securing the proper make of felting for the manufacture of spinal jackets, as disappointment will certainly follow the employment of any other than that which I have been using for the past three years. I do not know by whom this felt is manufactured, but I do know that it may be obtained from any reputable instrument dealer in this country at very small expense.—*Int. Journal of Surgery.*

EXTIRPATION OF CARBUNCLE.—Dr. Riedel has practiced immediate extirpation of carbuncles since 1883, and finds that this procedure is far preferable to the customary treatment by deep incisions. The operation is performed as follows: A circular incision is made through the skin around the infiltrated area, and from this a number of vertical incisions are made to radiate toward the healthy peripheral parts. At least four cutaneous flaps are thus formed, which are separated from the infiltrated tissues, and then the latter are dissected off from the fascia of the subjacent muscles. The hæmorrhage, which is frequently profuse, is controlled by means of compression and tampons. On the evening of the day of operation the temperature has usually become normal. On the following day the swollen cutaneous flaps are approximated; the opening in the center provides for drainage. The advantages of this treatment are: 1. A dangerous inflammatory focus is replaced within half an hour by a perfectly harmless loss of substance in the skin and subcutaneous tissue. 2. An extension of the local process or general infection are both excluded. 3. The loss of healthy integument at the periphery of the carbuncle is reduced to a minimum. 4. For this reason healing takes place rapidly and a good cicatrix results.—*Deut. Medicin. Wochenschr.*, No. 27, 1891.

SKIN GRAFTING AFTER EXCISION OF THE MAMMA.—Mr. Watson Cheyne, F.R.C.S., reports two cases illustrating the value of Thiersch's method of skin grafting in closing recent wounds, and thus enabling us to operate in cases where otherwise we might hesitate, as well as to perform the operation more effectually in less severe cases. In excising the breast great care should be taken to remove also all the fascia covering the pectoralis and other muscles exposed in the wound, partly because by doing so lymphatic vessels lying on this fascia, which might become infected, are also removed, and partly in order to lay bare a very vascular surface on which to fix the grafts. The grafts consisted of half the thickness

of the skin, as advised by Thiersch, because the chances of adhesion are greater. The skin having been well purified, long strips, about an inch in breadth, are cut with a long razor, preferably from the thigh, and are spread out on the raw surface, after the bleeding has been completely arrested. The strips must lie closely side by side—in fact, they should rather overlap each other and the edges of the wound. The extent of the wound to be covered at the time of operation will depend on the condition of the patient and the circumstances of the case. In any case it will always be best to cover the whole of the pectoralis at once. If it is not thought advisable to cover the whole of the wound at the time of the operation, any portion left can be readily grafted after the wound is granulating.—*Lancet.*

THE TREATMENT OF APPENDICITIS.—The treatment of appendicitis was recently discussed at a meeting of the Philadelphia County Medical Society, and although nothing new was brought forward, the discussion is of value as an exposition of the views of a number of distinguished physicians and surgeons on this still obscure subject. Dr. Pepper ably defended the medical side of the question, and urged moderation in the operative treatment. "If every case of appendicitis were operated upon," said he, "the mortality would be tenfold what it is now. As a general rule, these cases recover under medical treatment and remain permanently well afterward." He was entirely opposed to surgical measures in the intervals, and claimed that records showed that thorough treatment, hygienic, dietetic and medicinal, has been followed by complete cure. Mr. Bryant, the famous English surgeon, who was present, fully agreed with Dr. Pepper, and sentimentously remarked that delay in operating was the wisest course in the majority of cases. He thought that if the disease progressed slowly, commencing with localized pain and tenderness in the right iliac fossa, and attended with only slight swelling, the surgeon's knife could safely be dispensed with. He was opposed to purgation in these cases, and places his reliance upon rest and diet, together with belladonna externally, and opium internally. In all acute cases, however, or where symptoms of peritonitis develop, it was the surgeon's duty to interfere at as early a date as possible. As regards the propriety of operating between the attacks, Mr. Bryant's views were characterized by true conservatism. He called attention to the fact that in the majority of cases there is no second attack, and even if there is, it can be treated on the same lines as the first, operative interference being reserved for cases in which the symptoms do not rapidly recede. Mr. Bryant also prefers, in most cases, an incision more posterior than the right semilunar line, finding it easier in this way to reach the cæcum; and in the event of failure to discover the appendix, he contents himself with irrigating the part and treating it by the open method. Drs. Keen, Baldy and Price emphasized the importance of having a surgeon associated with the case from the beginning, so that he may become familiar with its features, and be ready to deal intelligently and promptly with the conditions when the time for operation arrives. The advisability of administering purgatives was also considered, and to judge from the tenor of the discussion, there exists still much difference of opinion on this point. Some favored the use of calomel and podophyllin, others the salines, while still others were opposed to purgation.

The discussion, of which we have given this brief outline, serves, however, to emphasize the inadequacy of our diagnostic resources, and to this should be attributed the divergence in the views of eminent physicians and surgeons on the question of treatment. If it were possible in most instances to recognize the exact condition present, it would be an easy matter to decide whether any given case is to be subjected to medical or surgical

therapeutics. The presence of pus or perforation calls for immediate surgical intervention, but, as Dr. Baldy justly remarks, "there are a large number of border-line cases in which it is next to impossible to say whether pus is present or not." At any rate, the association of a surgeon with the physician in the management of cases of appendicitis is a step in the right direction, and one calculated to produce a greater degree of unanimity in the views of physicians and surgeons, both as regards diagnosis and treatment.—*Internat. Journal of Surgery.*

THE OCULAR MUSCLES IN THOMSEN'S DISEASE.—Raymond (*Union Méd.*, June 11, 1891) describes two cases of Thomsen's disease. In one the internal recti of both eyes were hypertrophied, and the other eye muscles were becoming so. In certain movements of the head and neck there was coincident spasm of the lids; the reaction of the pupil was normal in both eyes; the optic discs and color sense were also normal. The left eye was astigmatic and slightly myopic, but the right eye was normal. The superior recti were affected with spasm in the second case; the pupils reacted very quickly to light; the optic disc and visual field were normal.

IN DIPHTHERIA, locally, Marchand's peroxide of hydrogen and whisky, internally, have established their value. A word in regard to the use of the peroxide: It should always be purchased in the smaller 4-ounce bottles, protected from the light by blue glass bottles, and corked with rubber. That sold by the druggists from large bottles is, in the majority of cases, worthless. It is a very unstable article, and unless it causes immediately a white, foamy reaction when brought in contact with the false membrane, it should be discarded, and another lot obtained. I am satisfied that I use it more freely and more persistently than most practitioners. I use mops made by twisting a sort of absorbent cotton upon sticks, using as many as thirty or forty in the twenty-four hours. Such mops will take up nearly a half ounce apiece, and, when forced well back into the pharynx, reach all parts. The gagging and resistance of the child assists in the distribution of the fluid. As soon as a mop has been used, it is committed to the fire. In this way I have treated the worst as well as the milder forms of diphtheria with complete success. I believe that the systematic use of definite, although often toxic doses, of whisky, even in children of tender age, are the surest safeguard against heart failure.—*Larabee, Am. Pract. and News.*

THE TREATMENT OF VARICOSE ULCERS.—Dr. J. Hartmann recommends ichthyol in the treatment of varicose ulcers of the leg. After cleansing the sore with soap and warm water he applies pure ichthyol to the ulcerated surfaces and covers them with a thick layer of cotton, which is secured by an unstarched gauze bandage. The application produces an intense burning pain which usually lasts only for a short time. During the following days the patient experiences great relief, but as soon as the sore again gives rise to pain or discomfort, the dressing must be changed. Even at the first change of dressings, the ulcer will be found to present a better appearance, it will look cleaner and, unless very chronic, will show signs of granulation at the margin.—*Correspondence Blatt. f. Schweitzer Aerzte.*

THE FORMATION OF A GASTRIC FISTULA IN CANCEROUS STENOSIS OF THE CARDIAC END OF THE STOMACH.—Dr. Lauenstein advises that in cases of marked cancerous stenosis of the cardiac end of the stomach, it is better not to resort to formation of a gastric fistula. He has had two cases of carcinoma of the cardiac, in which access to the stomach was prevented by the tumors

which were situated under the diaphragm. The neoplasms had invaded the mucous membrane of the stomach, which had to a certain extent lost its digestive functions. It may also happen that the stomach is so firmly fixed by adhesion of the tumor at the cardia that the formation of a fistula is attended with great difficulties. For these reasons the author prefers rectal alimentation in this class of cases. A cancer of the cardia should be suspected if the œsophageal bougie encounters resistance at a depth of 38 to 41 centimeters from the teeth. In one of his cases the author noted a loud systolic sound in the epigastrium, synchronously with the pulse, which the autopsy showed was due to pressure of the tumor on the aorta.—*Centralbl. f. Chirurgie.*

IN THE SWISS CANTON of St. Gaul, a law passed in 1890 provides that habitual drunkards may be placed under care in an inebriate asylum, for periods varying from nine to eighteen months, either on the ground of voluntary submission, or by direction of the local authority (District Council). Proceedings may be initiated by a relation or guardian of the drunkard, by any public body, or on the sole responsibility of the council, but they must be justified by a certificate from the medical officer of health, that such seclusion is necessary for the cure of the patient. If his personal property is insufficient to meet the expense, the public funds are to be applied, not only for his own maintenance, but, if necessary, for the support of his family during his enforced absence.—*Journal of Inebriety.*

THE Commissioners of the Lancashire Lunatic Asylums state in their annual report just issued, that "although drunkards are not generally regarded as insane, it is a question whether the habitual tippler might not with advantage be considered an irresponsible being, and treated as such." They point to the fact that in not a few cases the only cause that can be detected for a patient's insanity is the intemperance of one or both parents.—*Ibid.*

INEBRIETY is curable in nearly all cases in the early stages. After repeated poisoning or intoxications for years, conditions of degenerations come on, from which recovery is very rare. The drink impulse may die out, or be permanently checked, but the injury to the brain and nervous system remains.—*Ibid.*

INEBRIETY, as a disease, is more seriously affecting the moral and civil affairs of state than any other that will come under the notice of the practitioner of medicine. Excepting the poison of syphilis there is none other so productive of far-reaching morbid processes and capable of affecting all the tissues of the body as alcohol. The results either of moderate drinking or chronic alcoholism will extend to generations to come and show in crime, drunkenness, or nervous disorders. Inebriety and its attendant maladies are conditions of progressive degeneration. And while one may stand surprised when he starts out to trace up the history of a patient and finds that it can be followed back to a drinking father or mother, yet it is better for the physician and patient, for the former will know what is required of him and the latter will recognize the ability that may alleviate his trouble. But practically there is no limit to the possibilities of convincing information on this subject, and the more it is studied the less is there to be said in favor of the use of alcohol in any form.—*Dr. Reeder in Lancet-Clinic.*

GELSEMIUM is said to be an efficient remedy for toothache; at least, for the non-inflammatory varieties. Fifteen minims of the tincture, with two grains of quinine, are given every hour for three doses if required.

THE INSOMNIA OF CONTINUED FEVERS AND ITS TREATMENT.—In the earlier stages of these fevers insomnia is pretty certain to accompany the hyperthermia, while sleep often attends a fall in the temperature. It would seem that overheated blood is itself inimical to sleep by exciting the cerebrum. Certain it is that cold bathing—the cold or tepid bath—and antipyretics that bring down the fever, quiet the nervous disturbances and promote sleep. Hence, for the restlessness and insomnia of typhus and typhoid fevers, there is often no better treatment than a cold bath of about fifteen minutes' duration, the temperature of the water being from 60° to 75° F., and during the bath cold water may be poured on the head in cases of extreme pyrexia with restlessness and delirium. While fifteen minutes ought to be long enough to depress the febrile heat to nearly the normal, in some cases the bath may be of longer duration.

Where the cold bath is impracticable, from difficulties on the part of the patient or his surroundings, some one of the new antipyretics may be tried. There is much testimony in favor of acetanilid as a nervous sedative in fevers. Five grs. every hour for three or four doses (in an adult), will generally lower the febrile temperature two or three degrees, and one or two hours of quiet sleep (especially if the medicine be given in the night-time) is almost certain to follow. By many practitioners and hospital physicians, analgesin is regarded as the preferable hypnotic; the dose should be double that of acetanilid.

The antipyretics, though they undoubtedly have a marked action on the thermogenetic and thermotaxic heat centres, which are under abnormal irritation by the fever poison, an action which is extended to the higher cerebral centres, certainly do not affect the infectious agent, and hence the course of the fever is not influenced by them. Their prolonged use is probably attended by some cardiac depression (an evil to be especially shunned in fevers), and the best clinical authorities are shy of them, seeing no permanent advantage in the continued administration of these medicaments, but possible mischief. At the most, their employment is restricted to the obtention of such sedation as is needed for the nervous disturbances.

In regard to pure hypnotics, chloral is undoubtedly the best one. Sometimes, in the later stages of the fever, 20 drops of deodorized tincture of opium is of service. Sulphonal, chloramid and the newer hypnotics are not of service. Alcohol, in not too large doses, has a place in this line of therapeutics.

Febrile insomnia is essentially a toxic insomnia; this has been made apparent by the investigations of the last few years. Whether it be the microbes or their ptomaines, or both which excite the cerebrum and derange the nervous functions, has not been yet positively determined. Uræmia probably enters as an important factor; in the active stages of fevers, and in the declining stages when the circulation is oppressed and languid, and the prognosis is grave, elimination by the kidneys is always imperfect. Hence an important part of the treatment should be to promote the excretion of the poison and the removal of effete matters. Unfortunately, this indication can be but imperfectly met. All that can be done is by suitable nutrients and stimulants to sustain the organic forces in their struggle with the foe, and to favor elimination by the kidneys and other excretories. The various diluents (lemonade, barley-water, effervescent drinks, plain water, etc.) which are so freely given, because so constantly craved, promote excretion by the kidneys. Milk is often prescribed *ad libitum* as the sole drink and nourishment; its diuretic properties are well known. Some clinical authorities are in the habit of ordering mild diuretic mixtures (solutions of nitrate of potassium, of sweet spirits of nitre, with sometimes the addition for several successive days of a little digitalis) all through the fever, and claim good results.—*Therapeutic Gazette*, September 15, 1891.

TREATMENT OF TYPHOID FEVER.—"Dr. Tordeus has been employing with considerable success a treatment for typhoid fever in the St. Pierre Hospital, Brussels, which consists essentially of moderate doses of an antipyretic combined with an antiseptic. Thus ten grains of acetanilide and an equal quantity of resorcin, or about half that amount of thymic acid, are made up into a five-ounce mixture with a compound decoction of aloes, and tablespoonful doses given every three hours. This was found to exert a remarkably beneficial effect not only on the temperature, but also on the general condition of the patients. From trials made with acetanilide alone, it was evident that the antipyretic effect was almost entirely due to the combination with it of the resorcin or the thymic acid. Several children were included among the patients so treated, the doses given being, of course, proportionately smaller. Dr. Tordeus is of the opinion that treatment of a similar description will be found suitable in other zymotic diseases; indeed, he has tried a combination of acetanilide and benzoic acid in measles and in croupous pneumonia, the latter drug being selected in preference to resorcin on account of its possessing expectorant as well as antiseptic properties."—*Lancet*.

THE DRY TREATMENT OF CHANCROIDS.—It is generally conceded that if chancroidal ulcers can be kept very dry, a great step has been taken toward their rapid healing. With this view, the following procedure has been used to some extent in the surgical divisions of Bellevue Hospital, New York: A small roll of absorbent cotton about one-half an inch in diameter and long enough to surround the penis just behind the corona, is put in that position after the prepuce has been well retracted. A rubber thread band is slipped over this ring of cotton in order to hold it in place. By this means the sulcus behind the glands is obliterated, which is especially liable to retain the secretions, and the prepuce is held back from contact with the ulcerated surface. The cotton absorbs the exudation from those surfaces almost as soon as formed. The dressing is light, is easily handled, and may be renewed as often as need to keep the parts in a dry condition. In addition to chancroids, herpes preputialis and venereal warts have been found to heal rapidly under the use of this dressing; sometimes no other treatment has been found necessary for these local lesions.—*Canada Record*.

THE PROCLIVITY OF WOMEN TO CANCEROUS DISEASE.—Dr. Snow says that the number of women who apply at the Cancer Hospital is twice as great as that of the men, and this notwithstanding that the cases of cancer of the lip and tongue are almost all males. This excess of females is due to the prevalence of malignant disease of the uterus and mamma. He then asks why these organs are rich in cell-elements. Second, they are frequently exposed to irritation. Third, their normal condition and nutrition are interfered with by circumstances which he considers are more or less directly the result of what is called civilized life. Of these he specially blames constipation, over-pressure at school, the abuse of tea, and tight-lacing.—*Medical Record*.

THE INFLUENCE OF GRAVE-YARDS ON PUBLIC HEALTH.—Dr. J. W. Carhart, of Lampasas, Texas, has written a paper on this subject in which he drew the following conclusions:

From whatever standpoint this subject was approached, it must be with care and gentleness, since the graveyard, though a constant menace to public health, had a pseudo-sacredness fostered by the profoundest sentiment of our nature.

The method of the disposal of the dead should be founded on reason and not on custom or sentiment.

The interment of the dead in the earth was never en-

forced by a statute, Jewish or Christian, and was merely incidental to both dispensations.

No law, human or divine, require us to dispose of the dead in a manner prejudicial to the health and comfort of the living.

While it might be an open question as to the right of the State to decide as to the manner of the disposal of the dead, unless in exceptional cases, it was clearly the province and duty of the State to prevent such disposal as would in any wise jeopardize the interests of the living.

From all the facts at our command, we were led to the conclusion that the graveyard should become a thing of the past, and that incineration was the method most in accordance with science, sanitation, æsthetics, reason, and religion.

He would add, as a corollary to these several conclusions, that, since the intelligent, broad-minded physician was the almost exclusive guardian of public health in seeking to prevent the development and spread of disease, it was plainly his duty, when cemeteries were being located, to use his best endeavors to have them so placed as to jeopardize as little as possible the public health; and for its moral effect he should encourage efforts to beautify existing cemeteries; and that he should seek, as fast as possible, without too much violence to the tender sensibilities of the masses, to encourage incineration of the dead, or some other method more in harmony with sanitary science than the common modes now practiced.—*Medical Age*.

MISCELLANY.

MISSOURI VALLEY MEDICAL SOCIETY.—The Medical Society of the Missouri Valley will be held at Lincoln, Nebraska, December 17 and 18, 1891, at the Lindell hotel, corner Thirteenth and M streets.

First Day.—7:30 P.M.—Registration of Committee of Arrangements. 8:00 (a) Organization. (b) Report. Committee on Credentials. (c) Reading Minutes. (d) Miscellaneous Business. (e) Report. Committee of Arrangements.

Address by the President:—Higher Medical Education in the Missouri Valley.

Presentation of Papers.

1. Tumors of the Vocal Cords with Specimens, Hal Foster, M.D., Kansas City, Mo.
2. Self Tied Knot in a Funis, A. Bowen, M.D., Nebraska City, Neb.
3. Appendicitis, from the Standpoint of a General Practitioner, R. M. Stone, M.D., Omaha, Neb.
4. Pelvic Surgical Disease and Complications, How Dealt with, A. H. Cordier, M.D., McPherson, Kans.

10:30—Banquet at the Lindell.

Second Day.—9.00 A.M.—Report of Committees.

Presentation of Papers.

1. Removal of Faucial Tonsils by Galvano-Cautery Snare, H. W. Loeb, M.D., St. Louis, Mo.
2. Treatment of Fractures of Humerus. Report of Twelve Cases, Joseph Neville, M.D., Omaha.
3. Tubercular Knee-Joint Inflammation, with Specimens, A. F. Jonas, M.D., Omaha.
4. Rheumatism, S. Lane, M.D., Lincoln.
5. Synopsis of Ætiology, Pathology and Treatment of Sciatica, S. Grover Burnett, M.D., Kansas City.
6. Appendicitis, treatment of, with Illustrative Cases, J. E. Summers, Jr., M.D., Omaha.
7. Pathological Tonsil and its Relation to Nasal Drainage, F. D. Crim, M.D., Lincoln.
8. The Irritable Mucous Membrane in Gouty Subjects, Wm. Davis, M.D., Omaha.

9. Reflexes due to Hypertrophied Follicles of the Tongue, W. I. Dayton, M.D., Lincoln.

10. New Observations in the Use of Sulphonal, S. G. Burnett, M.D., Kansas City.

Miscellaneous Business.

INDIAN TERRITORY MEDICAL ASSOCIATION will meet in Muskogee, I. T., Tuesday, December 8, 1891.

Section on Practice of Medicine.—"Malarial Fever," S. A. Bryan, M.D., Wagoner, I. T.; "Malarial Hæmaturia," A. M. Clinkscales, M.D., Vinita, I. T.; "Some Advances in Medicine," W. B. Winn, M.D., Wichita, Kan.

Obstetrics and Gynecology.—"Ovarian Hyperæmia and Hæmorrhage," J. M. Boling, M.D., Claremore, I. T.; "Complicated Pregnancy," G. A. McBride, M.D., Ft. Gibson, I. T.; "Chronic Metritis," E. N. Wright, M.D., Lehigh, I. T.

Surgery.—"A few Errors of Country Surgeons," H. B. Smith, M.D., McAlester, I. T.; "Typhlitis and Perityphlitis," G. R. Rucker, M.D., Eufala, I. T.; "Abscess of Glands of Bartholin, with Report of Case," L. C. Tennent, M.D., McAlester, I. T.

Papers Contributed by Request.—"Obscure Abdominal Abscess, Autopsy, Report of Case," Philip Donahoo, M.D., Fairland, I. T.; "Abscess of the Middle Ear, Sequelæ," B. F. Fortner, M.D., Vinita, I. T.; "Pleurisy with Effusion," F. B. Fite, M.D., Muskogee, I. T.; "Peritonitis Following Amputation of Thigh—a Case," Drs. Dawson and Ledford, Afton, I. T.

NOTICE.—We are constantly in receipt of letters from physicians stating that they have not received the copy of "The Biography of Ephraim McDowell, M.D.," for which they subscribed through the author, Mrs. Ridenbaugh, and for which they paid in advance at the time of subscribing. As in these letters we are held accountable for the delay, in justice to ourselves we wish to explain that we are merely acting as publishers for Mrs. Ridenbaugh; that she paid for the printing of the book herself; that we have nothing whatever to do with the delivery of the books; no list of subscribers was furnished to us; we are in no way responsible for the filling of these orders; the book was merely manufactured for Mrs. Ridenbaugh at her expense; she retained the list of subscribers and was to attend to the delivery of the same.

We believe she was engaged in filling these subscriptions when she was taken sick and is just recovering from a long and severe illness, which accounts for the delay.

Any letters addressed to Mr. Louis T. Valentine, Knickerbocker Building, corner 14th St. and 5th ave., New York City, whom Mrs. Ridenbaugh has recently married, and who is managing the sale for her, will be given prompt attention. CHAS. L. WEBSTER & Co.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from November 21, 1891, to November 28, 1891.

Capt. Marlborough C. Wyeth, Asst. Surgeon U. S. A., leave of absence granted on surgeon's certificate of disability is extended three months, with permission to enter the Army and Navy General Hospital, Hot Springs, Ark.

Capt. William R. Hall, Asst. Surgeon U. S. A., granted leave of absence for twenty days.

Capt. Arthur W. Taylor, Asst. Surgeon U. S. A., leave of absence granted for seven days is hereby extended twenty-three days.

Capt. Marshall W. Wood, Asst. Surgeon U. S. A., is granted leave of absence for three months, with permission to apply for an extension of one month.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending November 28, 1891.

Middleton Semmes Guest, commissioned an Asst. Surgeon in the Navy November 19, 1891.

Surgeon Wm. Martin, ordered to the U. S. S. "Thetis," Asst. Surgeon Geo. B. Wilson, detached from U. S. S. "Thetis," and granted two months' leave.

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No. 24.

ORIGINAL ARTICLES.

STUDIES OF CRIMINALS.

DEGENERACY OF CRANIAL AND MAXILLARY DEVELOPMENT IN THE CRIMINAL CLASS, WITH A SERIES OF ILLUSTRATIONS OF CRIMINAL SKULLS, AND HISTORIES TYPICAL OF THE PHYSICAL DEGENERACY OF THE CRIMINAL.

Read in the Section of Medical Jurisprudence and Neurology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY G. FRANK LYDSTON, M.D.,

Professor of Genito-Urinary and Venereal Diseases in the Chicago College of Physicians and Surgeons; Fellow of the Chicago Academy of Medicine, and of the Southern Surgical and Gynecological Association, etc.,

AND E. S. TALBOT, M.D., D.D.S.,

Lecturer on Dental Pathology and Surgery, Rush Medical College; Fellow of the Chicago Academy of Medicine; Member of the Odontological Association of Berlin, etc.

The mutuality of interest involved in their studies of the degenerate classes, has led the authors of this paper to combine their observations in a joint paper. This paper, however, is too lengthy for presentation to this Section. We have, therefore, abridged the subject-matter as far as possible, with the view of presenting only the most important features of the essay, reserving its complete publication until some future time.

The present paper comprises a portion of an address upon "The Skulls of Criminals," with cuts of the more important specimens, delivered by Dr. Lydston, at the meeting of the Mississippi Valley Medical Association, September 11, 1890, together with some of Dr. Talbot's studies of the jaws of the degenerate classes, and deductions drawn from an extensive series of coöperative studies of criminals. No attempt has been made to formulate an arbitrary theory regarding the crime class. Indeed, it is the opinion of the authors that even the extensive researches of Lombroso, Ferri and others, have been insufficient in this respect. We advance the proposition—which is itself not a new one—that the crime class is simply a part and parcel of that human flotsam and jetsam which can be so aptly termed the world of degeneracy.

We give due credit to Lombroso, Ferri, Benedikt, Osler, Mills, Roussel, Badik, and numerous

other workers in this field, and are free to acknowledge that we do not hope to add much to what these eminent men have contributed upon this subject.

Very little has been done in America in the study of criminal anthropology. Nothing whatever has been done in the study of the degenerate development of the jaws as exemplified by the criminal class, hence our contribution to the subject may be of interest.

C. Lombroso, of Italy, has done most wonderful work in the study of the criminal classes. His "L'Homme Criminel" is justly regarded as a classic upon this subject. There is one point, however, in regard to his observations, that is worthy of serious consideration, viz.: it is to be remembered that he has collated his material in an environment entirely different from that in which the American criminal is found. This fact will explain the diversity of opinions regarding the crime class as observed here and in Europe. As Dr. Lydston pointed out in a paper on "The Pathogeny of Vice," published some years ago, the results of evolution and atavistic tendencies are necessarily more pronounced in the offscourings of the older social systems as met with in Europe. Our observations tend to show that the more pronounced criminal types, as seen in this country, are among the imported criminals.

The aberrant brain types as seen among the degenerate classes, and so excellently described by Benedikt, C. K. Mills and others, do not concern us in the present paper, save in a general way. As far as the specimens which we present are concerned, it is rational to suppose that an aberrant brain was present in each of the deformed skulls of our series. While external conformation is not an accurate criterion of brain development, it is still logical to suppose that when a skull is malformed through degeneracy, its contents are also involved in the maldevelopment, and from similar causes. There is often, however—and, according to Biliakow—especially among criminals, an entire lack of harmony between the external and internal measurements. Oftentimes the external circumference—especially in the frontal and occipital regions—is greater than the normal average, while the internal cir-

cumference is notably diminished. In case the relative deformity of the skull is due in a measure to an increased thickness of bone, much depends on the disposition of the increase, *i. e.*, on whether it is uniform, involving both tables of the bone, several bones, or is due to excessive development of external bosses. Lombroso advances sclerosis as an explanation of diminished cranial capacity when associated with large external measurements. The relation of syphilis to a disparity of the internal and external measurements and conformations is at once called to mind.

Other things being equal, the internal conformation is certainly a fair criterion of cerebral development; it is most positively an accurate criterion of cerebral conformation.

We wish to be clearly understood as recognizing perfectly the fallacy of arbitrary conclusions regarding cerebral development founded upon osseous conformation. As is well known, even the relative size of the cerebral mass itself has no definite and arbitrary relation to intellectuality. The old familiar illustration of the comparative measurements and weights of the brain of Daniel Webster and that of an idiot immediately suggests itself at this point. Spitzka has recently exhibited the brain of an idiot which weighed 68 ozs., but in which the ependyma was five times its normal thickness.

In the collection in the Army Medical Museum is a specimen which aptly illustrates the inaccuracy of the size of the brain as a criterion of intellectual capacity. This is the skull of a Chipewa squaw, of dwarfed and degenerate physique, who died at the age of 85. The stature of this subject was but 3 ft. 7 in. The skull measured 633 mm. in circumference, and presented a capacity of 2,760 cu. cent. The facial angle is 105°. The brain weighed 73.5 ozs.

The vertical index in this specimen is platycephalic, the horizontal brachycephalic. The occipital plane is almost horizontal, the parietal eminences extraordinarily developed. The facial bones present an arrest of development; the inferior maxilla is square, excessively developed and prognathous, the teeth are degenerate. These points are interesting as showing excessive maxillary, arrested facial and excessive cranial development in the same subject. The association of the defective structure in this specimen with disease is suggested by the fact that the subject had suffered with caries of the spine.

The variations of type of the degenerate brains of criminals and the insane, as shown by Benedikt, Osler, Roussel, Lombroso, Parker and C. K. Mills, embrace briefly: variations in number, length and development of convolutions, the question of length of gyres being of special importance. Simplicity of type of gyres seems to be indicative of degeneracy. Dr. C. K. Mills has

presented this subject in a very plain and comprehensive manner.¹ The researches of this author will be quoted in detail when the present paper is published in its entirety.

In one of Dr. Lydston's specimens (Fig. 24), the degeneracy of brain type is shown by the shallowness of the cranial fossæ and feeble development of the ridges, lines and prominences of the interior surfaces of the skull. In a general way the same may be said of all the other specimens of the series, those which are not imperfectly developed being excessively developed in varying localities.

Criminal anthropologists lay great stress upon the capacity of criminal crania. Tabular comparisons of large numbers have shown some very interesting points. According to Lombroso, the maximum of cranial capacity is met with in counterfeiters, the capacity in this class varying in different localities, but with two exceptions being greater in each locality than that of other criminals. Murderers and brigands are next in the scale. Thieves of the petty sort follow with a mediocre capacity, while the lowest is found among violators and incendiaries. These estimates are about what might naturally be expected in the various grades of criminality. The type of criminality varies with the degree of intellectual development, and the latter depends to a certain degree upon physical conformation. The tables of E. Ferri confirm Lombroso's deductions. He finds the greatest capacity among those convicted of assault, the smallest among pickpockets and professional assassins. Criminals who have been repeatedly convicted (*recidivistes*) present, according to Ferri, a smaller cranial capacity and frontal diameter, with a larger development of the jaws than the average normal subject. The researches of Baroffio, Riva, Troyski, Roussel, Corré, Biliakow, Manouvrier and others, are practically in accord with Lombroso and Ferri.

As compared with the researches of such investigators as those mentioned, our observations have been of a very general character, and we have as yet been unable to obtain a sufficiently large series of measurements to permit of a tabulated comparison of normal and criminal crania. We have observed, however, many facts which appear to us of great interest, drawn from the study of criminals confined in a number of our penitentiaries.

The most striking features of the criminal skull as seen in American prisons, are the tendency to brachycephalism and sub microcephaly, and the great frequency of cranial asymmetry. As far as our observations go, they tend to show that a degenerate type of skull is common among criminals, and that the assertion of Lombroso that the deviation of type, as far as the index is con-

¹ Transactions of the American Neurological Association, 1886.

cerned, is toward brachy-cephaly, is correct. The broad head is usually associated with a relatively low vertical index, *platy-cephalie*; the long head with a high vertical index, *oxi-cephalie*, which, however, is more than compensated for by the long transverse diameter in the one and the narrow transverse diameter in the other (Figs. 24 and 33).

The direction of degeneracy is modified by racial characteristics. Thus in the case of the Chinese, characterized by a relatively high index, the tendency of degeneracy seems to be in the direction of a more pronounced brachy-cephaly, although an occasional example of the opposite index is seen. The dolicho-cephalic type, when degenerated, becomes in general more dolicho-cephalic, etc.

In considering the degree of degeneracy the question of compensating increase or decrease of diameter must be considered as affecting capacity. A glance at the original of Fig. 33 while living would doubtless have suggested a capacious cranium, but a measurement of the vertical and frontal diameters puts an entirely different complexion upon the status of the subject as indicated by cranial capacity. A glance at Fig. 24 shows a cranium which to a superficial observer might appear to have considerable capacity. Yet it is ultra-brachy-cephalic, and even a proportionally exaggerated vertical diameter does not redeem it from sub-micro cephalic.

A striking feature of the degenerate skull as illustrated by many skulls in the habitual criminal class is its peculiarly twisted conformation. The form suggests what might result if the skull were taken while soft between the hands and twisted in such a manner that all points of anatomical correspondence are thrown out of their normal relations. The result would naturally be an asymmetry in all diameters. Figs. 34 and 35 show this most admirably.

The researches of Dr. Talbot in the jaws of the degenerate classes have been of extraordinary interest, and are rendered even more interesting by our joint observations of the jaws of a large number of criminals. The types of degenerate maxillary development are well shown by the appended drawings prepared by Dr. Talbot, and will be expatiated upon later on.

Lombroso, Ferri and Manouvrier claim certain peculiarities of development in the criminal jaw. Exaggerated development, preëminently among homicides, is the especial feature commented upon by Lombroso. Ferri has found the greatest diameter of the jaws among homicides and petty criminals, the smallest among professional murderers and pickpockets. The jaws according to Ferri are not well developed among the insane, save those who are the subjects of impulsive monomania. This does not agree with Dr. Talbot's observations.

In our studies of criminals we have found that the most marked variations from the average normal type of cranial development occur among the habituels. We have made no attempt to select special cases bearing out this assertion, but have studied each case as it has been taken at random. We append a series of observations upon criminals, selected by a convict orderly from among the habituels and murderers in the Joliet penitentiary. In reply to his inquiry as to what kind of cases we wished to study, we remarked that we wished to see old-timers or habituels. He therefore selected the prisoners according to their criminal, with an entire disregard of their physical status, with the possible exception of several who happened to be on sick call. All complaints of subjective ailments were verified by the resident medical officers.

We present the history and description of eighteen of these, taken in regular order:

Obs. 1.—White, male, American, aged 30 years. Has been committed twice for burglary. Was first committed at the age of twenty-two, since which time has been a confirmed criminal. Hereditary influences as a possible cause of delinquency not probable. Intemperance is admitted and is claimed to have had much to do with his moral degradation, and as he is markedly neurotic, this is highly probable. Syphilis is denied. Never experienced an injury until two years ago, when he received a severe fall with contusion of the head. This was followed by epilepsy, severe headaches, insomnia, deafness, defective vision in the right eye and pronounced right hemiplegia. Hearing normal. Mentality impaired. He is thin, anæmic and badly nourished. Was formerly right-handed but has acquired left-handedness since the accident.

The jaws, especially the inferior, are quite asymmetrical and the nose deflected, not from traumatism. Features very asymmetrical. Ears small, protuberant, pointed and asymmetrical, the left being the larger and more prominent. The septum nasi is thickened and greatly deflected. Cranium of medium development, of sub-brachy-cephalic type and rafter shaped calvarium. Jaw, orthognathous. Occipital region very prominent and asymmetrical, the protuberance being markedly deviated to the left of the median line. Pronounced asymmetry of parietal development, the left eminence being very prominent and the right perceptibly flattened. Palate imperfectly developed with a V-shaped arch.

Obs. 2.—White, male, Irish, aged 27 years. Sentenced for arson. Committed for the second time, the first offense being robbery. Has led a criminal life since childhood, being addicted to petty and minor delinquencies for which he escaped punishment. Knows nothing of his parentage or family. Has never been addicted to drink. Admits syphilis. Is thin, anæmic and

poorly nourished, says that he was never very strong. Right-handed. No lameness or deformity. Slightly deaf. Vision normal. Perceptive faculties somewhat blunted and mental processes sluggish. Is a melancholiac and suffers from severe headaches. Features noticeably asymmetrical. Nose perceptibly deflected and flattened, not traumatically. Septum thick, crumpled and on the right side enchondromatous, the right nostril being occluded. The ears are peculiarly deformed, the right being small, thick and crumpled, the left of medium size and very protuberant, handle shaped. Cranium large, ultra-brachy-cephalic, with platy-cephalic vertical index and resembling in its general outline the skull shown in Fig. 33. To the left of the vertex the calvarium is flattened, but the left parietal protuberance is very prominent, the entire left side bulging in outline. The right side is flattened and the parietal prominence slightly marked. The body of the occipital bone is very straight and flat, but the protuberance is disproportionally prominent. The facial outline is orthognathous, the jaw being of a pronounced retreating type and very asymmetrical. Palatal arch V-shaped.

Obs. 3 —White, male, American, aged 40 years. Serving second sentence for burglary. Prior to first commitment had been sentenced for numerous petty delinquencies and had been tried on charges of burglary and acquitted on several occasions. History shows a bad heredity. Mother healthy, but father died of consumption and a sister is subject to fits. Has been addicted to liquor. Says that liquor is responsible for his life of criminality (?). Contracted syphilis eighteen years ago, which has troubled him off and on ever since. General appearance very fair, is well nourished and of good color. Right-handed. No lameness or deformity, but plentifully supplied with syphilitic scars. Is quite deaf and vision is so defective that he reads with difficulty. Suffers from tinnitus aurium. The facial contour of this man is very striking. There is such a marked disparity and asymmetry of the two sides of the face that it has the appearance of two halves of faces of different sizes joined together, and by a bad artisan. Nose deflected markedly and septum twisted and mal-formed so that the left nostril is completely blocked. The ears are very asymmetrical and situated on different planes, the right ear being much the smaller and situated several lines higher than the left.

Cranium sub-micro cephalic and very asymmetrical. The right side of the cranium is very perceptibly flattened and the parietal prominence feebly marked. The left prominence is very marked. The forehead is low and retreating. The narrow and contracted skull in this case is directly noticeable, but the index is sub-brachy-cephalic on account of the markedly sloping

frontal region, which compensates in a measure for the narrow transverse diameter. The facial type is orthognathous. On examining the mouth, a high palatal vault of partial V-shape, with pronounced saddle contour on the right and full curve on the left, are noted. There is marked faucial and pharyngeal asymmetry. There is a lateral curvature, which accounts, in a measure, for the pharyngeal and faucial deformity.

An interesting feature of this case is that the subject suffered from constant and severe headaches until fifteen years of age. They then stopped, but were developed later in life by liquor. Has had them steadily for the last fifteen months and is suffering from insomnia—possible pachymeningitis syphilitica or alcoholica suggests itself in this connection.

Obs. 4. —White, male, German extraction, age 41. Serving time for murder. This case is most interesting as an example of illogical dispensation of law and of the physical basis of crime. The subject is typically neurotic; heredity bad, mother having died of cancer, and her branch of the family being subject to various forms of nervous disease. Cause of father's death unknown, but he was known to have been a dissolute character. The subject under consideration was struck in the head with a hatchet when a child. Since the age of eight he has had epilepsy, the fits occurring sometimes every three or four days and at others at very long intervals. Has at times escaped them almost entirely for a year or two and has then brought them on by indulgences in liquor, to which he was addicted; subject to violent paroxysms of fury at all times under slight provocation; has been committed to the asylum several times; history would seem to point to the furor epilepticus as a cause for the murder which this man committed. A noteworthy fact is that this man is very artistic and spends much of his time in making artificial flowers. Syphilis is denied and no evidences of the disease are perceptible; subject is pale and anæmic; is right-handed; vision normal, but is quite deaf in left ear; no deformity or lameness.

Features very asymmetrical, the right side of the face being much larger than the left. The nose is markedly deflected to the left, the septum being thickened, crumpled and deviated in the same direction. Ears very asymmetrical, the left being the larger, higher situated and badly formed. The right ear is very protuberant, imperfectly developed and crumpled.

Cranium of medium size, quite round and dome-shaped. Vertical index oxycephalic. Index markedly brachy-cephalic. The skull shows the same asymmetry as the face, the right side being disproportionally developed and the right parietal eminence very large. The left side is flattened and the parietal prominence barely

distinguishable. The arch of the jaw in this case is normal, but the development of the palate is defective and the rami defective in development.

Obs. 5.—White, male, American, aged 37. Committed for the third time for burglary. Family history unknown save as regards mother, who died of cancer. Has had syphilis and has been intemperate since youth. Was hurt in a railroad accident in 1881. Prior to this time he had worked tolerably steadily, but since the accident he had drank harder than ever and had developed an uneasy, restless disposition, which made honest labor irksome and criminality attractive. General appearance fair, is well nourished.

Right-handed and has no lameness or deformity. Complains of tinnitus in the right ear, referable he thinks to the railroad accident. Vision and hearing normal. Face very asymmetrical, the right side being much the larger. Right



Fig. 1.

alar prominence exceptionally marked. Left eye so disproportionally small as to attract the attention of the casual observer. Nose deformed and septum deviated to the left, but as the organ has been broken this point is not of great importance. Ears very small, crumpled and closely set, the left being much the larger and lower.

The skull is sub-micro cephalic in capacity, oxy-cephalic in its vertical and brachy-cephalic in its cranial index. The right half of the cranium is the smaller, with the exception of the right occipital and mastoid regions, which are excessively developed. The left parietal eminence is very prominent. None of the aberrations noted were referable to the injury, except possibly the nasal deformity. The superior maxilla is V-shaped.

Obs. 6.—White, male, Irish, aged 50. Serv-

ing a five year sentence for horse stealing. Served a six-year sentence twenty years ago for the same offense. Acknowledges repeated offenses for which he has never been punished.

Family history not clear, but says that father died of old age and mother of "fever sore" on her leg; has been intemperate since youth and has had severe syphilis; has had severe smallpox, with resulting great disfigurement, not shown in the cut; general appearance fairly healthy; is very awkwardly built, "slab-sided," as the orderly expressed it; his gait is of the shuffling or shambling variety; is right-handed; is lame as a consequence of syphilis; hearing normal; vision has been impaired for many years; features very asymmetrical; the face is long and narrow and the chin pointed, but not prognathous; the left eye much smaller than the right, not properly shown in cut and the entire left side of the face imperfectly developed; the nose is slightly flattened and the septum deviated to the

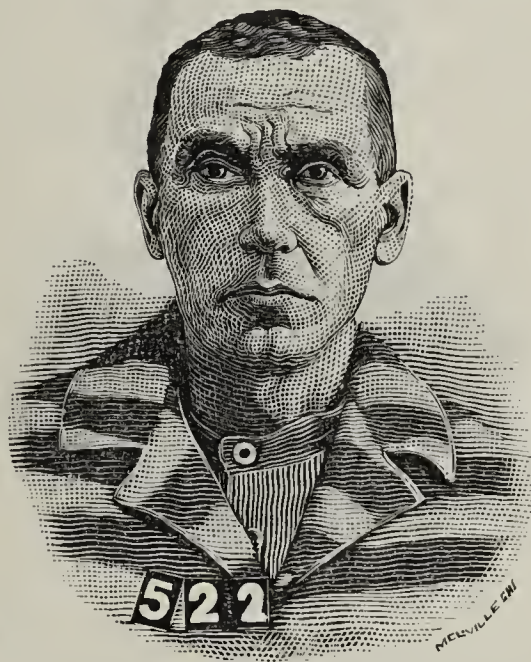


Fig. 2.

left, the nostril being nearly occluded; the ears are asymmetrically developed, the left being the larger, most thickened, irregular and deformed; cranial index brachy-cephalic; vertical index platy-cephalic; the large size and disproportionate breadth of the cranium are very noticeable.

The cranium is asymmetrically developed. The right frontal eminence is very prominent. The left parietal prominence is very large. The calvarium is depressed at the right of the vertex. There is also a well-defined depression at the bregma. The right occipito-mastoid region is excessively developed. The generally twisted appearance of cranium already alluded to is well shown in this subject. The jaws are saddle-shaped and the palate irregular and unevenly developed.

The actions and garrulous conversation of this subject showed him to be a paranoiac of a pro-

nounced type. A glance at the physiognomy of this man, as shown in Fig. 2, is suggestive to the neurologist in this connection.

Obs. 7.—White, male, American, age 53. Sentenced for horse stealing. Had several sentences elsewhere and is serving a second term in Joliet. Family history not obtainable; had been occupied in farming and horse dealing, alternating with horse stealing most of his life; no history of syphilis or alcoholism; general appearance bad, pallor and cachexia being pronounced; is right-handed; presents no lameness or deformity; vision and hearing normal; the features are very asymmetrical; the nose is quite straight, but the septum is deviated to the left, producing partial occlusion; the eyes are small, deep-set and somewhat of the slanting type peculiar to the Mongolian. This peculiar slant is most evident upon the right side; the right eye is also smaller

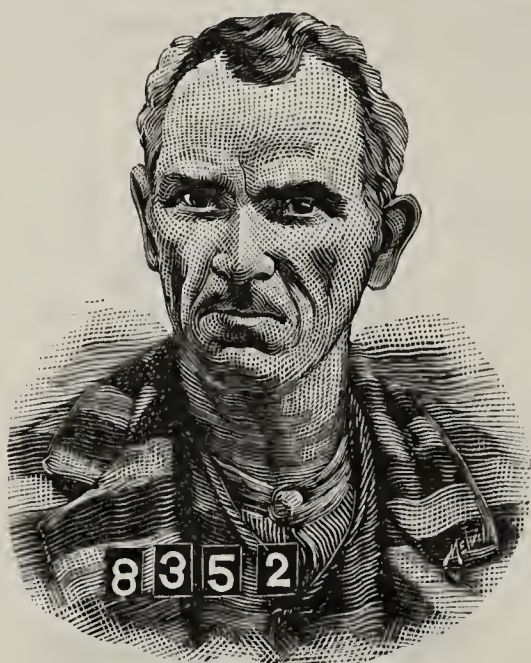


Fig. 3.

and on a higher plane than the left. The difference in development of the two sides of the face is very marked, the right being the smaller. The left half of the inferior maxilla is much longer and straighter than the right. Hair has been very gray since quite a young man. The right ear is of moderate size, of fair form and very closely set—the left is flattened, flabby and protuberant, “handle-shaped” and lower than the right.

Cranial capacity is meso-cephalic and cranial index subbrachycephalic. The vertex is pointed, oxycephalic with marked depression upon each side of the median line. The left occipitomastoid region is exceedingly prominent, the right being deficiently developed. The left parietal eminence is very prominent and the right poorly marked. Semi-V-shaped superior maxilla, lower maxilla well developed. The subject is an apt illustration of the irony of fate and the unintelligent administration of law. He is a par-

anoiac and affected with monomania of the religious delusional type. At times imagines himself Jesus Christ. He preaches in his cell to imaginary spirits, over which he imagines that he has control, and regales his fellow convicts with an occasional sermon on their wicked ways. His conversation is characterized by egotistical garrulity; is particularly desirous of impressing us with the idea that his magnificent head was designed for some great purpose which “died a-bornin’.” Like the preceding case, the physiognomy of this subject is to the alienist confirmatory of the foregoing remarks. Fig. 3.

Obs. 8.—White, male, Swede, aged 30; up for larceny, second conviction and acknowledges offenses for which he was never punished; has worked at different trades and occupations, but labored steadily until he received the injury herewith described. Family history obscure; mother had some skin disease of a severe type; has been a moderate drinker; syphilis is denied; general condition fair; is somewhat anæmic; is right-handed; some years ago was caught in a railroad smash-up and sustained a fracture of the skull; several years ago had his arm caught in machinery and received a compound fracture of the forearm; was in hospital seven months.

Hearing greatly impaired; vision normal. The face is very asymmetrical, the right side being the better developed, and the right half of the jaw especially prominent; nose of normal type; no deflection of septum; ears very asymmetrical, the left being larger and more closely set and decidedly pointed; the right is of medium size and normal outline, but situated lower than the left; jaws square and well formed, but the hard palate is very asymmetrical; left palatal process much broader than the right.

The cranium is large, horizontal index brachycephalic; vertical index platycephalic; the frontal region is asymmetrical, the right prominence bulging decidedly; the parietal prominences are exceptionally well marked, the left being much the larger; the entire right half of the cranium is disproportionately well developed with the exception of the parietal eminence; depression at site of old injury in parietal region. This subject, like the foregoing, should not be in prison. He is a paranoiac—has delusions of persecutions, quarrels with imaginary enemies in his cell and has on one occasion attempted suicide by cutting his throat.

Obs. 9.—White, male, American, aged 59. Fourth commitment; offense, horse stealing; committed three times before on “general principles; does not deny that said commitments were for the public good; heredity bad; father died of cancer of the stomach, mother was insane and died of consumption; says he does not give “fake” history for the purpose of exciting sympathy—says his motto is: “Sympathy be d—d

Has never been intemperate—says that he feared to drink on account of the insanity in his blood; syphilis is denied; had his head cut by a rock in Chester penitentiary years ago.

General appearance quite bad; is anæmic and poorly nourished; was originally right-handed, but on account of lameness in joints of right hand, has acquired the use of left; left arm is also lame from injury; joints are generally crippled by arthritis deformans; vision presbyopic; hearing normal.

The face is very asymmetrical, the right side being the larger; nose malformed and deflected to the right; septum deflected and presents a large perforation; ears of average development and symmetry; right ear a little lower than left; dental arches normal but inferior maxilla greatly flattened at angles and quite asymmetrical; cranium of average development; sub-brachy-cephalic index. Since the injury to his head this man states that he has "wild spells" when his mind is aberrated. These "spells" follow severe headaches.

This man, although uneducated, is quite talented, very bright and logically argumentative. His moral obliquity is evidently due to a bad heredity and lack of mental discipline. Under more favorable auspices he would have made a valuable member of society.

Obs. 10.—White, male, German, age 31. Serving sentence for grand larceny. Has been in prison five times, this being his third term in prison. Heredity bad; father healthy but intemperate, quarrelsome and subject to violent fits of passion, which made him a "dangerous custom" at times. An only brother, though honest, intemperate and a ne'er-do-well. Paternal grandfather said to have been a martyr to scrofula; has not been intemperate; syphilis denied, but states that he was very scrofulous as a child; extensive scrofulitic scars visible on neck and face; is still quite sickly, looks cachectic and poorly nourished; is right-handed; no lameness or deformity; vision and hearing normal; facial symmetry quite marked, the right side being much the larger. The nose is markedly deviated to the left and the septum much deformed and deviated to the right, producing almost complete occlusion. The left palpebral fissure much smaller than right; left eye perceptibly smaller than right; ears fairly symmetrical and well formed; cranium very large, index ultra-brachycephalic, vertical index platy-cephalic; fair degree of symmetry; left parietal eminence very prominent.

This subject has been affected with severe humming since childhood; is frequently under treatment for severe cephalalgia and has had since childhood what he terms "dumb spells," which we interpret as mental depression, probably associated with disturbed circulation.

The inferior maxilla in this case was poorly developed, orthognathous and very pointed; upper jaw presents a marked saddle-shaped arch.

Obs. 11.—White, male, Swede, age 27. Acknowledges habitual criminality, though serving first sentence; is in for highway robbery; heredity not shown; mother died of dropsy, and father of pneumonia; intemperance and syphilis both admitted; no history of injury; general appearance fair; right-handed; somewhat lame in left leg—thinks that always was weak in this limb; vision and hearing normal; face asymmetrical, left side much the larger—left side of the lower jaw being extraordinarily prominent; left palpebral fissure and eyeball much larger than the right; nose deflected to right, with marked corresponding deviation of septum; ears very large, long, pointed and closely set; cranium sub-microcephalic with sub-brachy-cephalic index; oxycephalic vertical index.

Development of average symmetry. In his general characteristics this subject is a weakling and the crime for which he is doing time is inconsistent with his physique.

The jaws in this case are markedly deformed, the upper presenting a semi-V and the lower a marked saddle.

Obs. 12.—White, male, half-breed Egyptian, age 35. Serving sentence for horse stealing. Says that it is his first commitment, but his statements are contradictory and he has either been committed before or has led a criminal life without punishment; the family history is imperfect, as he was born in Egypt of a native mother and an American father. One brother is known to be insane but not criminal; has drunk periodically after he has had one of the "fits," to be described; syphilis denied; when quite a young man he enlisted in the American navy and served for some years; was finally discharged for disability, having been sunstruck while in the foretop, falling to the deck and sustaining severe head injuries, the scars of which still remain. After his discharge he suffered from epileptic fits at intervals of from a few days to a few weeks; is still suffering from these attacks and from severe headaches; criminal career began since injury (?).

General appearance excellent; right-handed; no lameness or deformity; head badly scarred from old wounds; vision and hearing normal; face fairly symmetrical; eyes equally developed; right side of face slightly the larger; nose not deformed, but septum deviated to the right with partial occlusion of nostril; ears very small, closely set and crumpled.

Cranium large and index sub-brachy-cephalic; development asymmetrical; right side much the larger; occiput unequally developed, right half being very prominent, left parietal eminence very large as compared with the right; jaws normal.

Degeneracy of physical type is not very pronounced in this subject. We consider the history of injury a very important point.

Obs. 13.—White, male, American, aged 26. Committed for the first time for forgery; acknowledges petty delinquencies before sentence for forgery; family history bad; father delicate, scrofulous and affected all his life with sore eyes; mother died of consumption; has been a steady but moderate drinker; syphilis denied; general appearance good; right-handed; vision and hearing normal; face quite asymmetrical, left half much the larger; left eye much smaller than the right; nose straight and symmetrical, but septum markedly deformed; ears symmetrical, but very small and closely set; cranium of medium size and asymmetrical; index meso-cephalic; left occipito-parietal region disproportionately developed; right half of occiput flattened; protuberance situated seven mm. to the left of the median line; left parietal eminence very prominent.

Facial development marked; pronounced prognathism of inferior maxilla.

Obs. 14.—White, male, Irish (typical imported criminal), aged 54; in for bank robbery on long sentence. This is one of the toughest specimens that ever broke into jail; he has done time in a number of prisons in America and served several sentences in England before being exported to this country by the generous British authorities; family history bad; father intemperate; both parents died of consumption while subject was very young; one brother died of consumption; has always been a hard drinker; has had syphilis; general appearance very bad, is thin, sallow and badly nourished; has a chronic cough; is somewhat crippled by rheumatism, otherwise no lameness or deformity; hearing normal; vision impaired by age; face very asymmetrical, left side being disproportionately developed; left eye perceptibly the larger; right frontal prominence, however, is bulging and prominent; nose badly deformed, septum enchondromatous and deflected and so badly deformed that it is visible externally; ears very prominent and pointed, the left is badly crumpled.

Cranium sub-micro-cephalic; index sub-dolicho-cephalic; fairly uniform development on each side, but right side much the larger.

Lower jaw small, prognathous and left half much the larger; upper jaw large with low arch.

Obs. 15.—White, male, Dane, aged 42; serving life sentence for murder; family history good; has never been intemperate and until the commission of the crime for which he is under sentence he was an honest hard-working farmer, distinguished only by a violent temper; the murder for which he is doing time was the result of a quarrel; has never had syphilis; general appearance excellent; right-handed; vision

and hearing normal; no lameness or deformity; features asymmetrical, the preponderance of development being on the left side; nose deformed and deflected to the right; septum shows a corresponding deflection; ears asymmetrical, the right being pointed, closely set and of medium size, the left large, protuberant and lower set than the right.

Cranial capacity meso-cephalic; index sub-brachy-cephalic; pronounced asymmetry, the left side being the larger, the development of the left occipito-parietal region being especially disproportionate; the right parietal eminence is much larger than the left; the forehead is low and retreating; frontal prominence slightly marked on left side and absent on right; upper jaw excessively developed and prominent; arch semi-V shaped; lower jaw prognathous and heavy and disproportionately developed on the left side.

Obs. 16.—White, male, American, age 42. Serving a life sentence for a murder which had been committed in a quarrel. Prior to this crime had been an industrious farmer. Family history unknown; alcoholism and syphilis denied; general appearance fair; right-handed; no lameness or deformity; is lame at times from rheumatism; vision impaired; hearing normal; nose well shaped; no deflection of septum; ears small, thin and closely set; cranium above the average capacity and fairly symmetrical; index brachy-cephalic; some flattening at the bregma and in the occipital region; upper jaw excessively developed and partial V-shape; lower jaw massive and prognathous.

Obs. 17.—White, male, age 17. This is one of the most melancholy cases which have come under our observation. The prisoner, a bright handsome boy, having been sentenced for life for a murder committed while under the influence of liquor. The lad was raised on a farm and his family history is unexceptionable. Habitual intemperance denied; no history of syphilis; general appearance excellent, but subject is plainly neurotic; is right-handed; no lameness or deformity; vision and hearing normal; facial development quite symmetrical save a little excess of development of the right half of the inferior maxilla; nose slightly deviated, with some deflection of septum; ears large and protuberant (*oreilles à anse*); capacity of cranium meso-cephalic. Practically no asymmetry, the form of the cranium being better than the average normal type. The lower jaw is asymmetrical as above noted and the upper jaw presents a partial V.

Obs. 18.—White, male, American, age 61, doing time on fourth commitment. Last offense burglary and arson. Family history unknown. Was evidently a vagabond in early life but was never convicted of crime and he states was nev-

delinquent until 1871, since which time he has been in jail off and on—in fact for the greater part of the time. Intemperance and syphilis is denied. Drifted into the army in his early manhood and was several times wounded. Is lame from a saber cut in the left leg and head shows a large scar from a saber cut received in '63.

General appearance excellent; vision and hearing normal; right-handed; has been gray for many years; face fairly symmetrical; nose slightly deflected, but septum well formed; ears well formed; cranial capacity meso-cephalic; index brachy-cephalic; asymmetry not very pronounced; left parietal eminence disproportionately prominent; occipital region exceptionally flat; mastoid prominences excessively developed; normal arch in upper jaw; lower jaw very prominent, heavy and prognathous.

The foregoing cases might be multiplied from the material at our command, but they are amply sufficient as indicative of what may be found among the degenerate classes met with in our American prisons. A glance at these cases plainly shows the physical degeneracy, and often the bad heredity of the subjects. A noteworthy fact is that the cases which most nearly approximated the normal type of development were in sporadic criminals, of which the young lad (Obs. 17) is an example. It will be noted that a number of the series were of foreign birth. As before remarked, it will be found that the most markedly aberrant types are seen in the imported criminal. This is instructive as explanatory of some of the apparently dogmatic claims of European criminal anthropologists. We have found that left-handedness is not so common among American and foreign American criminals as has been claimed by these authorities. Among 400 criminals in the Joliet penitentiary but one per cent. were found to be left-handed. Dr. Lydston found but about two per cent. among the criminals in the New York City prison. Obviously a much larger number of observations would be necessary to determine this point.

Regarding deviations of the form of the nose, ears, etc., we are well aware that these aberrations of development are frequent among normal individuals, or at least those reputed normal. We do not believe, however, that so large a proportion is observable in normal as in criminal subjects. It is to be remembered, moreover, that degeneracies of development are present in many otherwise normal subjects, whose *morale* is such that no delinquencies have occurred. We have nothing to do with the co-relation of criminal tendencies with osseous aberrations save in general way, *i. e.*, we advance only the proposition that *cæteris paribus*, cerebral degeneracy is to be expected in cases where the osseous framework is markedly aberrant. The same influences govern the development of both nerve

and bone tissue, hence like results are to be looked for.

The history of alcoholism in criminals is to be studied very carefully. "I was drunk when I did it," is the old familiar plea, and to be taken *cum grano salis*. Alcohol often develops inherited or innate acquired tendencies; seldom, in our opinion, is it a cause of criminality, *per se*. It is the touchstone—the crucial lymph—that brings out the inherent infection of madness, crime or bestiality. Heredity is the latent power, and alcohol the potential energy that drives the arrow to the mark.

Very little has been written upon the subject of aberrant development and asymmetry of the skeleton. In looking up this subject a few years ago in the medical library at Washington, only twenty-four cases could be found in foreign and American literature. The only work treating upon this subject has lately been issued by Dr. Sutton, of England, and this but elementary in character. It is a singular fact that, in the study of the defective classes, the attention of scientists has been almost wholly confined to the study of the brain. The most interesting portion of the subject, asymmetry of development of the osseous framework, has been almost entirely neglected. The study of the development of the bony structure through the medium of the defective classes, opens up a field for investigation which is decidedly interesting. That the brain is defective in the flotsam and jetsam of humanity, has come to be generally accepted. The question now is, "Does a defective brain influence the development of the tissues of the body, or is it coincidental with defective development in general, and if so, to what extent?" We must assume that if the tissues in one part of the body are affected by faulty nervous structure, the tissues in other parts may also be affected. We must also assume that if the tissues on one side of the body are arrested in their development, as a consequence of trophic derangement, the tissues of the opposite side may also be arrested or excessively developed from the same cause. It is more difficult to observe this asymmetry of development of the body in general, because of the distance of the parts from each other, than to observe the inequalities of the cranium and maxillæ. Here we have the lateral halves in such close proximity that even a casual glance by an accustomed eye will recognize the smallest deviation in the bones of the head, face and jaws. We would naturally, therefore, select the cranium and maxillæ for an accurate examination.

In the degenerate classes in general, there is a certain degree of similarity of aberrations of type of cranial development. In idiots and the insane, as well as in the habitual criminal, we observe micro cephalic as well as macro cephalic crania. In such cases the jaws may become well devel-

oped or arrested, according to the degree of the development of the skull, although sometimes independent of it. Asymmetry is very marked in these individuals, especially in the hereditary and habitual criminal.

Although prepared to find a goodly proportion of atypical conformations of the jaws and teeth among criminals, our observations gave results which were a little surprising.

There were 477 criminal subjects examined, of whom 468 were males and 9 females. Of the whole number 3 were Chinese, 18 were negroes, and the remainder were whites, the latter representing many nationalities.

The following table shows the different deformities of the jaws and teeth that were found:

larities of the lower teeth are always due to local causes, such as the influence exerted by the irregular teeth on the upper jaw when coming in contact with them in the act of mastication. Deformities of the jaws, as already observed, are more noticeable to the casual observer than deformities of other osseous structures, because they are in closer proximity to each other than the outlines of the lateral halves of the rest of the body, and because any deviation from the normal occlusion of the teeth can be detected at a glance.

The deformities of the jaw proper which we have observed in the criminal classes are fixed and definite in character and few in number, while those of the alveolar processes and teeth

DEFORMITIES OF THE JAW AS SEEN IN CRIMINALS.

No.	Sex.	Normal.	Large Jaw.	Protrusion Lower Jaw.	Protrusion Upper Jaw.	High Vault.	V-Shaped Arch.	Partial V-Shaped Arch.	Semi-V.	Saddle Shaped Arch.	Small Jaw.	Partial Saddle.	Semi Saddle.
468	Male..	163	66	17	5	70	13	79	19	59	30	92	24
	9 Female	9	9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Percentage..		36.06	15.72	3.56	1.04	14.67	2.70	16.56	3.98	12.36	6.29	19.28	5.03

In the majority of the cases the jaws of the negroes were well developed. One had a partial V-shaped arch, one a saddle, one a V, and in one the left body of the lower jaw was found to be much smaller than the right. The bones of the head and face were also well developed. The three Chinese were all sub-microcephalic, with very small jaws, and two of the three had saddle-shaped arches. It is worthy of note that the nine females examined had large and well developed jaws, with normal arches.

In no part of the osseous system is arrested and excessive development so conspicuous as in the superior and inferior maxillæ. In this region, therefore, we would naturally expect to meet with the aberrations of degeneracy. The reason for this lies in the fact that, while the inferior maxilla is developed independently of the other bones of the skeleton, and attains its normal size by exercise, the superior maxilla, being a fixed bone, is dependent upon the various influences which govern ossification of the bones at the base of the skull, and determine whether such ossification shall be defective, excessive or normal. Some of the causes of aberrant development are inflammation of the parts *in utero*, hereditary taints, eruptive fevers and other constitutional diseases.

It is a singular fact that most of the deformities of the jaws and teeth are confined to the superior maxilla. When deformities of the inferior maxilla occur, they consist in either excessive or arrested development of the bone, while irregu-

are numerous and variable.

The deformities of the jaw proper consist of excessive or arrested development of one jaw while the other may be normal, or, one may be over-developed and the other stunted. Sometimes the right side of one jaw will be normal while the left side will be either excessive or arrested in development. In other cases the two sides will present different forms of development. Again, one may frequently observe a lower jaw with a normal body, while the rami are arrested or excessively developed, or the reverse may be found, *i. e.*, normal rami, with an arrested or excessive development of the body.

Fig. 4 illustrates the condition of excessive development of the upper jaw, as seen in Obs. 14. The jaw, alveolar process and teeth protrude to such an extent that when the jaws are closed the individual is unable to close the lips.

Fig. 5 illustrates excessive development of the body of the lower jaw, as seen in Obs. 13-18 and in one of the negroes. This deformity is called an "over-bite." The lower teeth protrude and shut outside the upper, which is the reverse of normal occlusion.

Fig. 6 illustrates arrest of development of the rami of the jaw, as seen in Obs. 4. The borders of the alveolar processes, which contain the teeth are not parallel, and as a result, when the molars make their appearance at the twelfth year, the anterior part of the jaw is forced open.

Fig. 7 illustrates arrested development of the superior maxilla, producing a deformity similar

to that seen in Obs. 13 and 18. There is no protrusion of the anterior superior alveolar process and teeth, owing to the absence of the germs of the lateral incisors and bicusps, hence these teeth are wanting. The result is that all the superior teeth that are in place, shut inside the lower teeth. When arrest of development of the superior maxilla takes place, and all the teeth are present, two forms of deformity of the jaws and teeth are always observed. The V-shaped arch (Fig. 9), as seen in Obs. 5 and 18, and one of

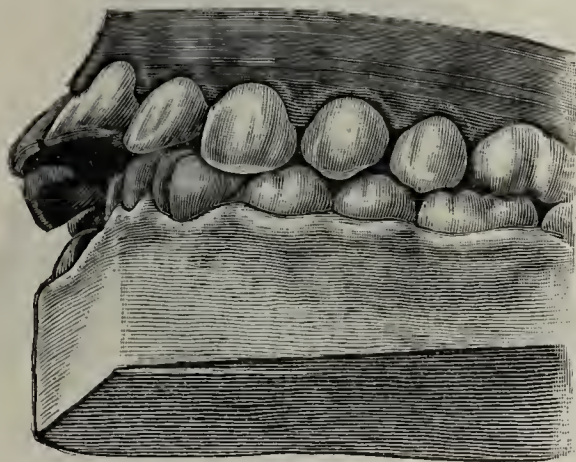


Fig. 4.

the negroes, and the saddle-shaped arch (Fig. 8), as seen in Obs. 6, 10 and 18, and also in one of the negroes. The V-shaped arch is always contracted anterior to the cuspid teeth, while in the saddle-shaped arch the arch is contracted posterior to them.

These peculiar deformities commence to form at about the eighth year, *i. e.*, these deformities are produced while the permanent teeth are erupt-

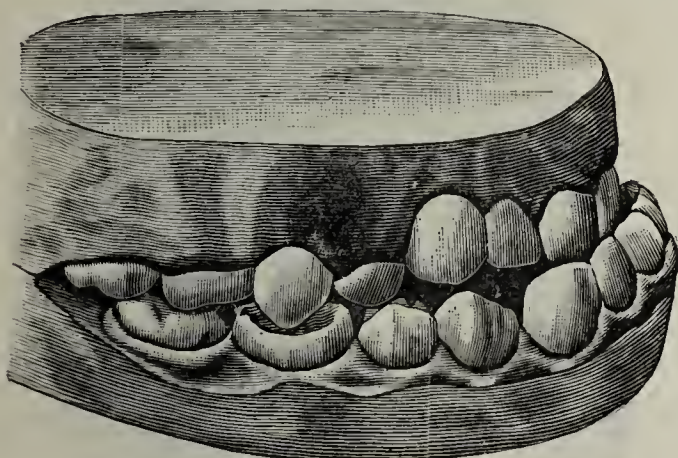


Fig. 5.

ing. The reason for this formation is that the long diameter of the jaw is not large enough to contain the long diameter of the teeth. The peculiar variety formed depends upon the time and order of the eruptions. It frequently happens that the teeth upon one side will erupt in their natural manner and at the proper time, in which case the jaw and teeth upon that side will be normal. The other side, owing to premature extraction on the one hand, or on the other to delay in removing the temporary teeth, will form either a

semi-V-shaped arch (Fig. 10), as seen in Obs. 1, 2, 3, 7, 11, 15 and 16, or a semi-saddle-shaped arch (Fig. 11), as seen in Obs. 3, which had a semi-V on one side and a semi-saddle on the other.

The foregoing illustrations represent the types of aberrant development of the jaws and teeth, as met with in the degenerate classes, and can be readily verified by even a superficial examination of the criminal classes. As far as their accuracy as illustrative types is concerned, they

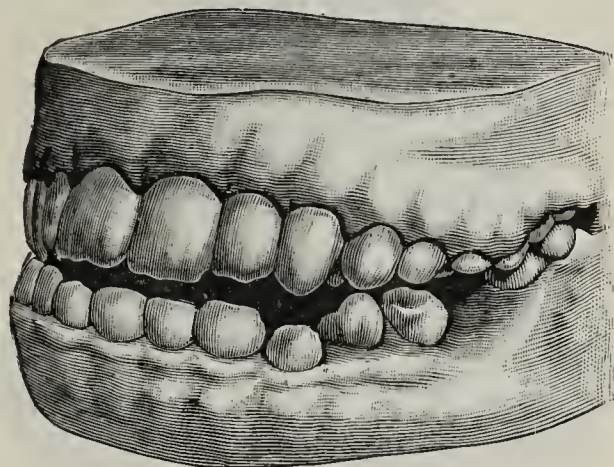


Fig. 6.

are fairly representative of the various types of deformities as outlined by Dr. Talbot, from a careful study of nearly 4,000 irregularities of the teeth.

It is our fortune to be able to present in this paper a series of illustrations of specimens showing the aberrant types and asymmetry found in degenerate skulls, and especially those of criminals. These specimens are exceptionally interesting from the fact that they have not been se-

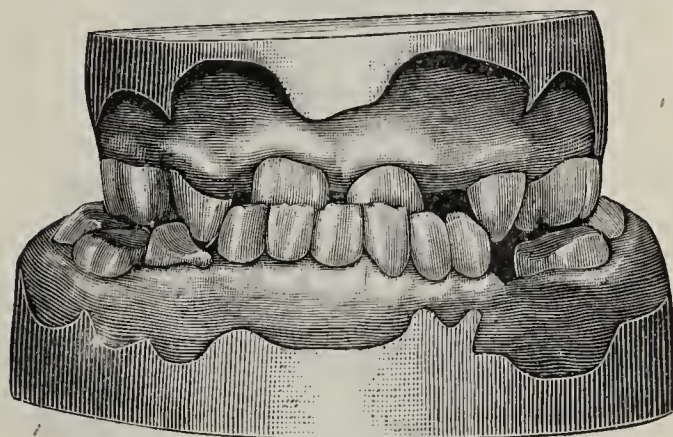


Fig. 7.

lected from among a large number, but have been picked up here and there by non-scientists solely for their morbid and hysteric interest, having subsequently fallen into Dr. Lydston's hands quite by accident. It is worthy of comment that even the remarkable series depicted in Lombroso's "Atlas" does not present such markedly aberrant types as this comparatively small series of studies; indeed, a search among several thousand skulls would not be apt to bring to light such peculiar types of conformation as the crania

which we present. The illustrations are from photographs, and are exceptionally accurate.

The specimen first to be described is one of the most interesting crania which we have had the privilege of studying. The subject was a negro criminal of the petty class, who spent most of his time in correctionary institutions. As might be inferred from the extremely degenerate type of cranial development which is here exhibited, he



Fig. 8.

was of a very low grade of intelligence. After a very precarious existence, this negro committed suicide.

In viewing this skull from the front, one is at once struck by the immensely powerful maxillary and malar development, as contrasted with the

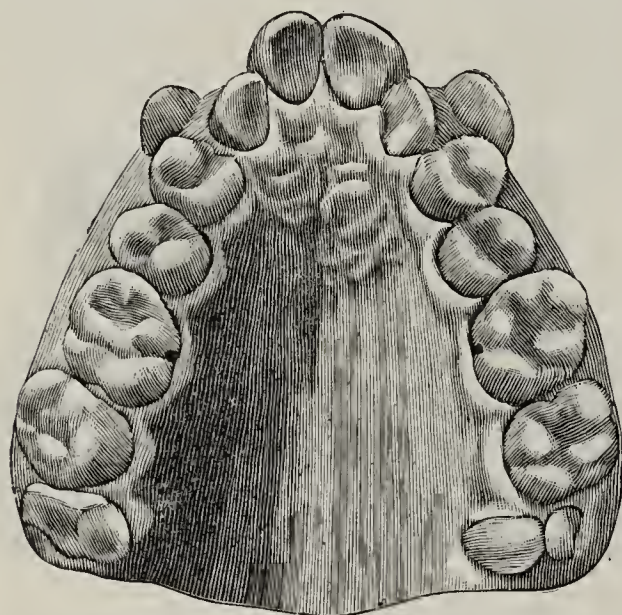


Fig. 9.

remainder of the cranium. The orbits are relatively very capacious. The superior maxilla is relatively poorly developed, at least as compared with the lower jaw. Rarely, indeed, is such an inferior frontal development found associated with such a pronounced facial development.

As will be seen in connection with the specimen of brachy-cephalic degeneracy shown in Figs. 33, 34, 35, the frontal development in this

narrow type of a skull may be vastly better than some specimens with a decided tendency to the brachy-cephalic type. The skull at present under consideration is the most marked specimen of the dolicho-cephalic cranium which we have seen. As the horizontal index in this case is 59.9, the extreme variation, according to Isaac Taylor and others, being from 58 to 98, the extreme type of this skull is at once obvious.



Fig. 10.

On viewing this skull laterally, its strong similarity to the arthropoids is very striking. This is especially marked with respect to the development of the mastoids and the occipital protuberance; the position of the latter is quite an anomalous one, and the occipital bone is almost horizontal. Despite its extraordinary develop-

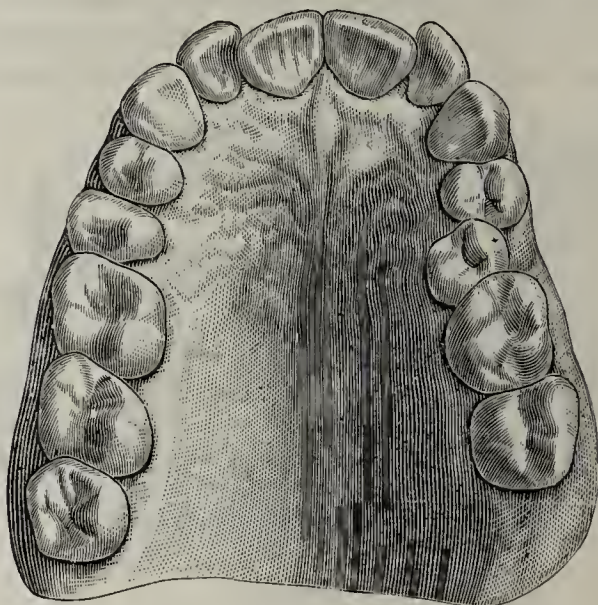


Fig. 11.

ment, the occipital is relatively small, both transversely and in its vertical measurement. The distance from the posterior border of the foramen magnum to the superior occipital angle is only 103 mm.

On contrasting with any of the other crania of the series, the relative shortness of the occiput is very noticeable. For example, Fig. 22, which is a rather small specimen, distinguished rather

by the symmetry than by the extent of its development, shows an occiput measuring 130 mm. from the foramen magnum to the superior angle of the occipital bone.

Fig. 14 shows the inferior surface of this dolicho-cephalic specimen, and brings out the massive development of the processes and muscular attachments at the base of the skull. It is evi-



Fig. 12.—Front view of extreme dolicho-cephalic cranium.

dent that the muscles of the neck in this case were immensely powerful, a *sine qua non* where the leverage for muscular action is so short as in this particular occiput. The facial type in this specimen is markedly prognathous, as regards both upper and lower jaws.



Fig. 13.—Lateral view of extreme dolicho-cephalic skull.

The *tout ensemble* in this case is strongly suggestive of a reversion to the anthropoid type, which is often the distinguishing characteristic of the degenerate Ethiopian type, criminal or otherwise.² The following are the measurements of this exceedingly interesting cranium:

² Dr. Lydston has found in comparative studies of crania that the plane of the occipital bone is of some importance as bearing upon differentiation. In the anthropoids, the relative shortness and horizontal direction of the occipital bone is very striking—especially is this true of the basilar process. In the degenerate types of human crania, or, at least, in the atavistic types, there seems to be a direct relation between the length and angle of the basilar process and intelligence. Dr. Clevenger called attention to the angle of the medulla as bearing upon intelligence, years ago, but Dr. Lydston's observations, although confirmatory of those of Clevenger, were made independently, as he had not had access to the work of the latter.

Horizontal index.	59.9
Circumference.	48.4 c.
Anterior demi-circumference	21.3 c.
Posterior demi-circumference	26.9 c.
Bizygomatic diam.	13.3 c.
Longitudinal diam.	196.5 mm.
Transverse diam.	122 mm.
Vertical diam. (vertex to foramen magnum)..	132 mm.
Occipito-mental diam.	241.5 mm.
Bifrontal diam.	95 mm.
Bimastoid diam.	114 mm.
Over vertex, from ear to ear	317 mm.
Ant. bord. foramen mag. to sup. occip. angle.	103 mm.

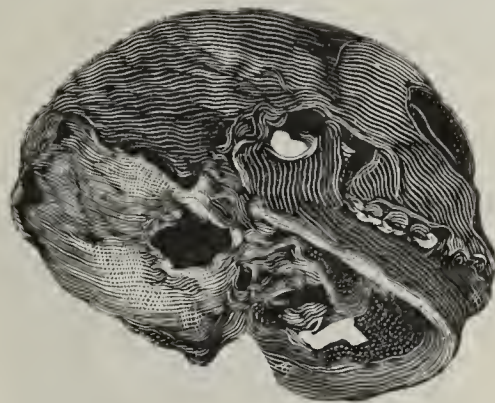


Fig. 14.

The excessive development of the jaws and alveolar processes in this specimen is such as is generally observed in the negro races, in whom the jaws are generally well developed and rarely



Fig. 15.—Skull of Mongolian suicide (Brachy-cephalic).

deformed. The only noticeable feature of this particular specimen is a high palatal vault.

The next specimen is not especially noteworthy from the standpoint of degeneracy, being interesting chiefly on account of its peculiar history, and its exceedingly fine development. It is, however, an excellent illustration of the brachy-cephalic cranial type.

The subject was a Chinese cigar-maker, of Chicago, who is remembered to have been thoroughly civilized and quite prosperous. Physically he was a fine, well developed and handsome fellow. He became engaged to a white girl, whose Mongolian affinity weakened at the last

moment, and this preying upon his mind, impelled our Mongolian friend to shoot himself. This was noteworthy, as he was the first Chinaman in America to commit suicide, and there has been but one since, as far as we can learn. The peculiar religious belief of the Chinese explains the rarity of suicide among those in America.

The contrast between the negro skull, Fig. 12 and Fig. 16, is very striking and obvious to the most careless observer. A front view of this specimen shows a splendid development of the jaws and teeth. We have never seen a finer or



Fig. 16.—Skull of Mongolian suicide (Brachy-cephalic).

more regular set of teeth than this. Like the negro race, the Chinese is characterized, on the average, by well formed and strong jaws and teeth.

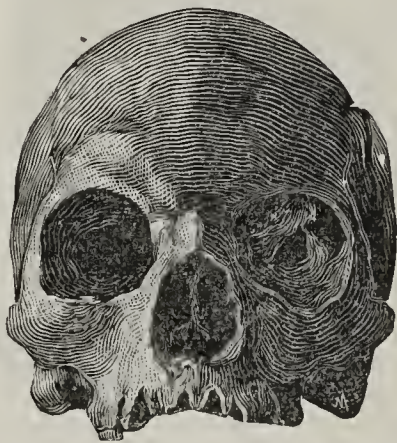


Figure 17.—Negro panel-worker (Dolicho-cephalic).

The characteristically excessive development of the facial and jaw bones among the Chinese is well shown by a lateral view of this skull. The disproportionate development of the face and jaws in this instance is, however, much above the average Mongolian skull. By comparing the two views, the brachy-cephalic type of the cranium is readily observed. By comparing the views of this cranium with those of the negro shown in Figs. 12 and 13, one may observe the wide difference between the extreme types of high and low cranial indices. This is nowhere better

shown than by a comparison of marked Ethiopian and Mongolian types.

On examination of the crania of more degenerate types among the Chinese, it will be found that the tendency is towards a high cranial index. The tendency of the degenerate type of a brachy-cephalic race to become more brachy-cephalic, and that of a dolicho-cephalic race to become more dolicho-cephalic, is peculiar, but is borne out as far as our opportunities for study have permitted us to observe.

Aside from a change in the cranial index there are seen, among negroes particularly, many pe-

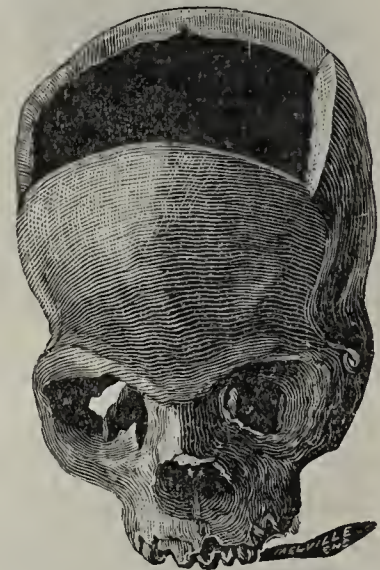


Fig. 18.—Negro panel-worker (Dolicho-cephalic).

culiar aberrations of form, one of which is shown in Fig. 28. The palatal arch in this Mongolian specimen is high, and the alveolar processes excessively developed. The measurements of this skull are:

Horizontal index	83.9
Circumference.	50.6 c.
Anterior demi-circumference.	29.4 c.
Posterior demi circumference	21.2 c.
Longitudinal diam.	174 mm.
Transverse diam.	146 mm.
Vertical diam.	145 mm.
Bimastoid diam.	127 mm.
Bifrontal diam.	96 mm.
Foramen magnum to superior occipital angle.	139 m.

The next specimen presents some extraordinary features. It is the skull of a celebrated negro panel worker, confidence operator and desperado who, at the time of his death, was the consort of a notorious courtesan who flourished in Chicago some years ago. This individual, after some years' dalliance with the law without especial harm to himself, was finally knifed in a brawl. A front view of the cranium shows the ordinary and characteristic negro facial type, with the exception, perhaps, that the bones are exceptionally massive and well developed. Unfortunately, the inferior maxilla is absent, a fact which we greatly deplore, as the general cranial development suggests to us the probability that the missing part presented some very interesting features for consideration. A lateral view of

this cranium shows the ordinary dolicho-cephalic negro type. The cranial index is low, being 72.1. A comparison with Fig. 12, however, shows the extreme degeneracy of type in the latter to great advantage.

A view of this skull (Fig. 18), after a section of the calvarium has been removed, shows its most interesting feature. Skulls of such extreme thickness, even among negroes, are rarely met with. The consistency of the bone in this cranium is very dense and hard, and traditionally

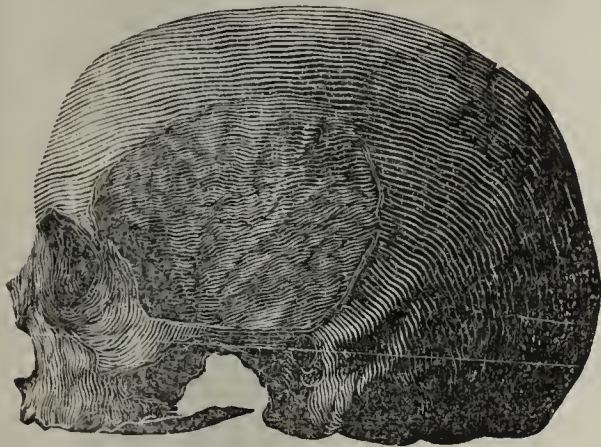


Fig. 19.—Skull of prostitute (Dolicho-cephalic).

this negro, when he was alive, was noted for his butting propensities. Violent contact with such a skull would be apt to damage the fist of a Sullivan. Indeed, it is said that this fellow rather enjoyed the impact of a policeman's club.

We will state at this point, that we are of the opinion that the massiveness of bony development in this case is not due to disease. The

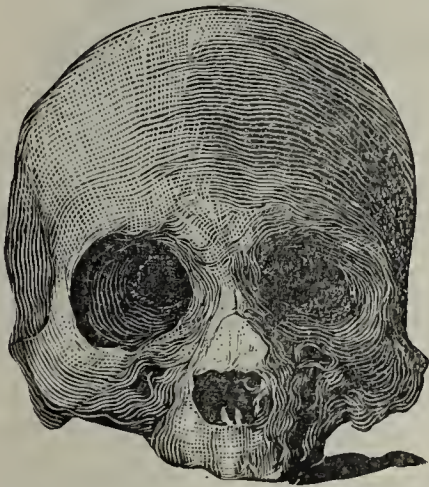


Fig. 20.—Skull of prostitute (Dolicho-cephalic).

general character of the overgrowth and the consistency of the bone would seem to support this view. Syphilis may produce thickening of the cranial bones, as some of Virchow's specimens show, but syphilitic bone does not present the characters and uniformity present in this case.

At the densest part of the calvarium this specimen measured 13 mm. in thickness, its average thickness being 11 mm. A comparison with Fig. 12 readily shows how phenomenal the osseous

development in this case is. The cranial measurements are:

Horizontal index	71.1
Circumference	47.8 c.
Anterior demi-circumference	25.4 c.
Posterior demi-circumference	22.4 c.
Longitudinal diam.	181.5 mm.
Transverse diam.	131 mm.
Vertical diam. (vertex to foramen magnum).	128 mm.
Bifrontal diam.	95 mm.
Bimastoid diam.	113 mm.
Bizygomatic diam.	126 mm.
Anterior border of foramen magnum to sup. occipital angle	117 mm.

The upper jaw and alveolar process in this skull is well developed, the only peculiarity being a low palatal vault.

Figs. 19 and 20 show the skull of a once notorious member of the Chicago *demi-monde*. She was a very tall woman of mixed Indian and white blood. The cephalic index shows what might be inferred from the appearance of the cuts—a decidedly dolicho-cephalic type and a peculiar outline. This specimen is the most symmetri-

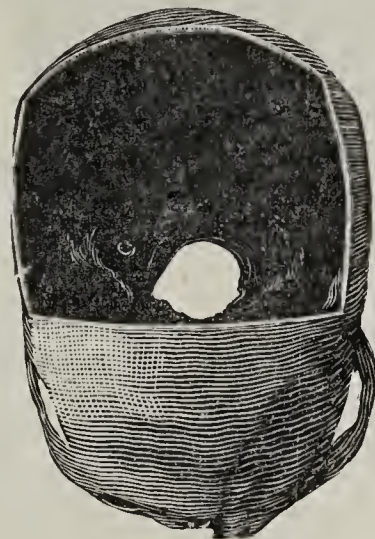


Fig. 21.—Skull of prostitute (Dolicho-cephalic) Calvarium partially removed.

cally developed of the series, with the exception of the Sioux squaw, next to be described, and whether co-incidental or not, the fact remains that this subject presented a higher type of intellectuality while living than any of the other subjects embraced in this essay. The skull is, nevertheless, of a degenerate type, as shown by its extreme tenuity and its markedly dolicho-cephalic index.

Fig. 21 shows the extreme thinness of the calvarium, which was at the point of section only 3 mm. in thickness. A striking feature of this skull is its freedom from prominences, its surface being uniformly smooth and rounded. In this respect the specimen differs greatly from another cranium of a prostitute in the same series which we have examined, but of which, unfortunately, we have no illustrations. In this case there was an excessive development of the occipital bone, the enlargement being symmetrical and most marked upon the left of the median line. The

right parietal eminence was excessively and disproportionately developed. The cranial index was markedly dolicho-cephalic.

The principal measurements of the skull at present under consideration are:

Horizontal index	67.09
Circumference.	51.2 c.
Anterior demi-circumference,	22.9 c.
Posterior demi-circumference	27.3 c.
Longitudinal diam.	190 mm.
Transverse diam.	130.5 mm.
Vertical diam.	128 mm.
Bifrontal diam.	88.5 mm.
Bimastoid diam.	71 mm.
Bizygomatic diam.	130 mm.
Anterior border foramen magnum to ant. sup. occipital angle.	116 mm.

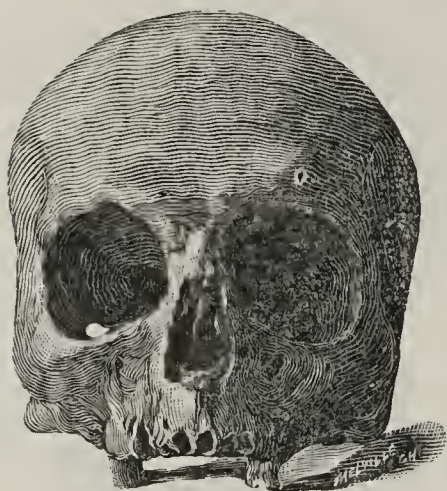


Fig. 22.—Skull of Sioux squaw (Dolicho-cephalic).

The jaw in the case is poorly developed but fairly well formed. In regard to the extreme tenuity of the skull, we do not believe that it is the result of pathological change. The general lightness of the bones and the symmetry of the skull are not consistent with the existence of such bone changes as might produce absorption



Fig. 23.—Skull of Sioux Squaw (Dolicho-cephalic).

and thinning. The markedly dolicho-cephalic type of this skull is interesting in view of the strain of Indian blood in the subject. As has already been observed, the degenerate type in dolicho-cephalic crania is in the direction of a still lower index and in this instance the admixture of Indian blood evidently determined the degenerative type. This observation would appear to be contradicted by the case outlined in Figs. 12, 13, 14. In this case, however, there

was an admixture of negro and Mexican blood, with a resultant degeneracy of form in general as well as in the cephalic index. This case, in fact, partakes in some respects of the character of a teratological rather than an atavistic type, *per se*—at least as far as the facial development is concerned.

A comparison of the prostitute's skull with the female Indian type next presented shows a marked difference in the cranial index, the disparity being 7.07. Even the negro in Fig. 17 is less dolicho-cephalic than this specimen. The



Fig. 24.—Half-breed Mexican and Negro (Ultra-brachy-cephalic).

next specimen, the cranium of a full-blood squaw of the Uncapapa Sioux, who was the wife of one of the leading malcontents in the recent Indian



Fig. 27.—Half-breed Mexican and Negro (Ultra-brachy-cephalic).

outbreak, and consequently of the better type of Indian development.

This specimen is exceptionally symmetrical and moderately dolicho-cephalic. Aside from the purposes of contrast, there is little of interest to be said of it in connection with the present series. The subject was as intelligent as the better class of her people *av rage* and there is nothing to be said regarding her from the moral

standpoint. Indeed, as the saying goes, the shoe might be on the other foot, as the Indian estimate of the Caucasian grave-robber is not a high one, as evidenced by his treatment of the desecrator of the Indian burial-places when the latter happens to be caught. However, as our connection with the aforesaid desecration is very remote, we trust that our red brother will extend his forgiveness.

Fig. 23 shows the same skull in lateral view. Its symmetrical outline is quite evident. The measurements are as follows:

Horizontal index	74.16.
Circumferential	51.2 c.
Anterior demi-circumference	26.6 c.
Posterior demi-circumference	23.8 c.
Longitudinal diam.	161 mm.
Transverse diam	152 mm.
Vertical diam	140 mm.
Over vertex from ear to ear	318 mm.
Occipital protub. to root of nose.	293 mm.
Bimastoid diam.	121.5 mm
Bifrontal diam.	96 mm.
Anterior border foramen magnum to superior occipital angle	130 mm.



Fig. 26.—Outlines of ancient Peruvian skull mechanically deformed.

The superior maxilla presents arrested development. The vault is of medium height and the alveolar processes well developed. It will be found that in the Indian, as in all primitive races, a well-formed palate and regular teeth are the rule. It would be interesting, at some future time, to study the effects of civilization of the Indian in this regard.

The rule regarding the development of the jaws in the primitive races, has had especial stress laid upon it by Dr. Talbot in his work on irregularities of the teeth and jaws.³

The next cranium which we describe is the

³ I am of the opinion that the exceptions to this rule are much more numerous than Dr. Talbot would have us believe. Comparative studies of primitive crania and jaws show some very interesting facts. Among the older Egyptians, relatively small, oblique, narrow and pointed jaws, associated with relatively large and symmetrical cranial development were not infrequent. Arrested or excessive development of the facial bones was not rare. Among the skulls of the older Romans, skulls with peculiar obliquity of the occipital plane and angular outline of the occipital parietal regions are to be found. It is also highly probable that maxillary aberrations were not infrequent. Specimens of Polynesian skulls show numerous examples of excessive and defective maxillary development. In as primitive a

most remarkable of the series and in many respects presents phenomenal characters.

The subject was a half breed Mexican and negro, who had left Mexico—his native country—for the good of his compatriots. While he had never distinguished himself by any startling act of criminality and had managed to keep himself out of the clutches of the law, he was identified with the petty criminal class which forms a prominent portion of all social systems, and with which Mexico is especially infested. He finally died in a public hospital, as a result of some acute disease with cerebral complications. The



Fig. 27.—Inferior surface of half-breed cranium.

general physique of this man was very fair, although he presented a generally overgrown and loose-jointed appearance. When alive he was a very peculiar looking specimen indeed, the

type as the Malay, excessive development of the inferior maxilla, with resulting extreme prognathism, arrested development of the superior maxilla and excessively high vault may be met with. Among the mound-builders aberrations of cranial and maxillary development were frequent. Posterior flattening is frequent but not typical. Extreme oxy-cephaly and platy-cephaly are to be found in certain of these skulls. Arrested and excessive development of the jaws is often met with. The Esquimaux type of jaw is varied by excessive breadth, great narrowing and marked obliquity on the one hand, or angularity on the other. A peculiar aberration occasionally seen is a flaring out of the lower border of the rami. This is usually associated either with the broad and angular type. The result is a most striking "jowl." Specimens of Aleut and Alaskan skulls also present aberrations of maxillary type. Among the American Indians similar aberrations are to be seen. The Modocs, now almost extinct, showed pronounced variations of cranial and maxillary development; the teeth, however, were usually strong and well formed, as is typical of our native races. The crania of the native Californians of the lower types, the probable progenitors of the Piutes, Shoshones and Diggers, present marked and frequent cranial aberrations, associated often with excessive or defective maxillary development. Prognathism is frequent. The almost typical maxillary characters of this degraded race are extreme obliquity and slightly marked angles of the inferior maxilla; so pronounced is this feature that the jaw is almost symmetrically curved. This type of jaw is interesting as bearing upon the theory of the relation of jaw conformation to character; the California Indians of the lower grades are the most degraded specimens of humanity imaginable. Ethnologists give the bushman a low mark enough in this respect, but he must yield the palm to the American Digger. The Sioux present great variation of type of cranial and maxillary development. The great variation of orbital indices is striking and lends color to the suspicion that the importance of the orbital index as a criterion of race is a bit overdrawn. Independently of mechanical causes there appears to have been great variation of type among the older Peruvians. Superior and posterior flattening and enormous development of the parietal eminences were frequent. These aberrations tend to limit the application of the rule which Dr. Talbot has advanced regarding the pure races.—G. F. LYDSTON.

dome-shaped appearance of his cranium being exaggerated by a luxuriant crop of kinky wool, several inches in length, that stood straight out from his head. From a mental standpoint he was up to the average of the negro race, but morally speaking he was decidedly degenerate. One of his prominent characteristics was a very irritable and irascible temper.

This cranium, as is well shown in the appended illustrations, is most markedly brachy-cephalic; indeed, its circumferential outline is almost perfectly round, its longitudinal and transverse diameters being nearly equal. The term dome-shaped is as nearly accurate as possible from a descriptive standpoint. It is a singular fact that the degenerate type of the African skull often presents the oxy-cephalic or rafter-headed type, even when the dolichocephalous index is pronounced. These rafter heads are often seen.

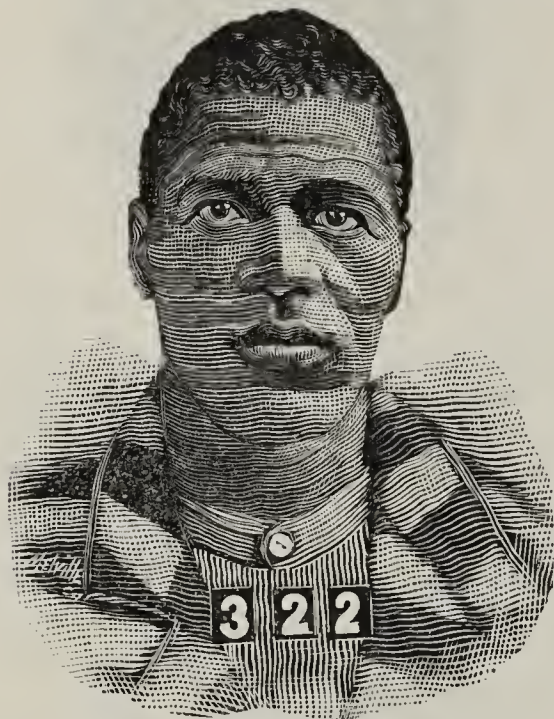


Fig. 28.—Dome-shaped cranium; Mulatto (Brachy-cephalic).

The skull at present under consideration is, as already remarked, a distinctive dome shape, which corresponds not at all with the rafter head.

The peculiar conformation in this case is evidently not the result of pathological conditions or mechanical pressure. The vault of the cranium is quite symmetrically developed, although the base of the skull is decidedly asymmetrical, as will shortly be shown. We know of no mechanical means which might have caused the peculiar dome-like form of this specimen, and we have been unable to find mechanically deformed crania of a similar type. Such deformities as those presented by the Chinook or Flat-head Indians are quite familiar types of skulls mechanically deformed. Certain specimens found in ancient Peruvian graves are almost precisely identical with the characteristic Chinook type and

show a probably common origin of the two races. This type is fairly well shown by the conventional outline of Fig. 26.

There are several interesting features in connection with the skull under consideration: One of the most striking is the extreme shallowness of the orbits. This is well shown by comparison with some of the other types already described, the measurements being one and three quarters inches from the upper margin of the orbit to the optic foramen, while in the Indian and negro skulls in this series the orbits measure two inches in depth. The outer walls of the orbits encroach upon the cavities, giving a still more marked appearance of shallowness. The form and index of the orbit is given considerable weight by anthropologists as a criterion of racial type.⁴

The inferior maxilla also presents some pecu-



Fig. 29.—Dome-shaped cranium; Mulatto (Brachy-cephalic).

liarities: The coronoid processes are very small and short, the body long and the angles very oblique. The anterior alveolar process is excessively developed. The same is true of the alveolar process of the superior maxilla, it being so situated on the outer surface of the jaw that the teeth were necessarily tipped in to facilitate occlusion with the lower teeth. The central incisors were evidently lost in early life, the alveolus being absorbed and the border of the jaw only one-eighth of an inch in thickness at this point. The palatal vault is very low and the general development of the jaws imperfect.

⁴ I claim, and have verified by comparative studies of orbital development, that the form of the orbit is of even greater importance as bearing upon the question of degeneracy of type. The marked variation of the form and measurements of the orbit is incidental to differentiation, is seen by observation of the anthropoids. There is a striking difference between the members of the Simian group in this respect, and a still greater difference is noticeable between the *simiidae* and *lemuridae*. The shallowness and obliquity of the orbits in Fig. 24 is strikingly similar to the characters observed in the gorilla and chimpanzee, which are quite different from those noted in the orang. The general outline of the orbits and their proportionate relation to the facial development in Fig. 12 are also decidedly Simian in character.—G. F. LYDSTON.

There is a marked deflection of the vomer and ossæ nasi, evidently of non-traumatic origin and due to excessive development of the osseous and cartilaginous structures of the septum nasi. The nasal spine is enormously developed. The cranial index in this case is extraordinarily high, being slightly above the maximum given by most anthropologists. The type is as marked in the direction of a brachy-cephalic index as is Fig. 13 in the direction of a low or dolicho-cephalous index.

Fig. 27 shows the inferior surface of the skull under consideration. A glance suffices to show

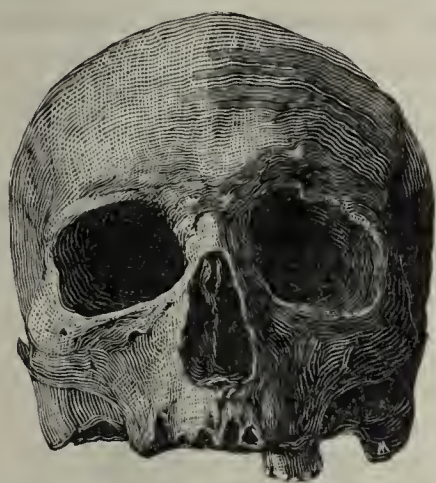


Fig. 30.—Skull of Western desperado (Brachy-cephalic).

its remarkable asymmetry. The foramen magnum is almost entirely to the left of the median line. A line drawn through the center of the foramen traverses the median line of this surface at an angle of about forty-five degrees. The center of the anterior border of the foramen is situated at 76.5 mm. from the left and 58 mm.



Fig. 31.—Skull of Western desperado (Brachy-cephalic).

from the right mastoid. The center of the posterior border of the foramen is 64 mm. and 61 mm. from the left and right mastoids respectively. The margin of the foramen is extremely thin and the occipital ridges very prominent. The measurements are:

Horizontal index	98.1
Circumference	46.5 c.
Anterior demi-circumference	22.6 c.
Posterior demi-circumference	23.9 c.
Longitudinal diam	146 mm.
Transverse diam	143 mm.
Vertical diam	148.5 mm.

Root of nose to occipital protuberance . . .	313 mm.
Anterior border foramen mag.to sup.occ.angle, 91	mm.
Bimastoid diam.	115 mm.
Occipito-mental diam	248.5 mm.
Bifrontal diam.	95 mm.
Bizygomatic diam.	133.5 mm.
Over vertex from ear to ear	350 mm.

On comparing the longitudinal, vertical and transverse diameters of this remarkable skull with those of some of the others of the series, the relatively great height of this dome-like cranium



Fig. 32.—Skull of Western desperado (Brachy-cephalic).

is made very apparent. Thus the diameters are:

	Trans.	Long.	Vert.
Fig. 12	122 mm.	196.5 mm.	132 mm.
Fig. 15	146 mm.	174 mm.	145 mm.
Fig. 17	131 mm.	181 mm.	128 mm.
Fig. 19	130.5 mm.	190 mm.	128 mm.
Fig. 21	152 mm.	161 mm.	140 mm.
Fig. 31	140.5 mm.	180 mm.	136.5 mm.
Fig. 33	149 mm.	168 mm.	118 mm.



Fig. 33.—Desperado and train-wrecker (extreme Brachy-cephalic).

Those of the specimens under consideration being trans., 143 mm., long., 146 mm., and vertical 148.5 mm., a comparison with Fig. 33 is especially interesting.

While making some observations at the Joliet penitentiary we discovered an example of the dome-shaped brachy-cephalic cranium, which strongly resembles the extraordinary specimen just described.

This subject is a mulatto about twenty-three

years of age, who is doing time for attempted murder. He is a surly, truculent fellow, of a low grade of intelligence and inclined to be unruly. He is at present suffering from a mild type of syphilis. The form of the cranium is well worthy of remark, the more especially as it so nearly approximates the types shown in Figs. 24 and 25.

The facial bones, jaws and teeth in this case were extremely well developed and the palatal vault normal. There was no history of mechanical compression, and as the subject was born in Tennessee such a cause is improbable, if not impossible.

The measurements were not complete. As far as taken they were:

Horizontal index	76.7
Root of nose to occ. protuberance over vertex.	39.5 c.
Circumference	50.8 c.
Transverse diam	145 mm.
Longitudinal diam	191 mm.
Occipito-frontal diam	59 mm.
Occipito mental diam	28.5 mm.

The dome like form of this cranium will be more evident on comparison of the two principal

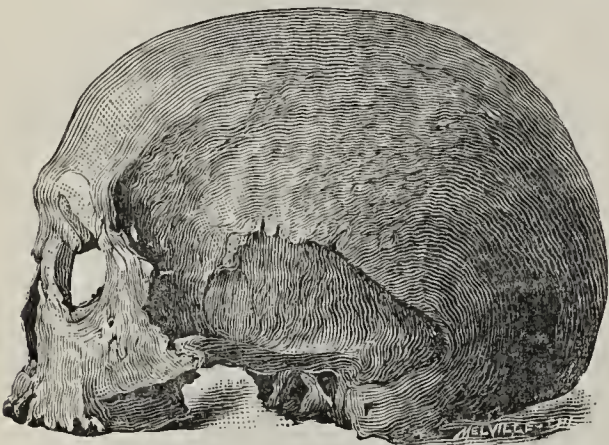


Fig. 34.—Desperado and train-wrecker (Brachy-cephalic).

measurements with those of a skull of average development. A comparison was made with that of one of the white orderlies in the prison hospital, a man of fine physique and good cranial development. It was found that while the measurement over the vertex was the same as that of the negro, 39.5 c., the circumferential measurement was 58.5 c.

The next specimen (Fig. 30), is the skull of a noted Western criminal and desperado, who was lynched for train wrecking in Wyoming a number of years ago. The conduct of this man during the progress of the lynching stamped him as a bravo of the most hardened type. An attempt was made to induce him to relate the particulars of a murder in which he had participated, the wife of the murdered man being present at the hanging and anxious to learn the details of her husband's death. To the persuasive efforts of the "regulators" and the tears and entreaties of the widow of his victim, he replied: "D—n it, you'll hang me if I tell, and you'll hang me if I

don't. So here goes," saying which he deliberately kicked the barrel upon which he was standing out from under himself, and thus saved his self-appointed executioners all further trouble.

This specimen is brachy-cephalic and chiefly characterized by its marked asymmetry.

The occipital region in this cranium is excessively developed, prominent and bulging, being especially prominent on the left of the median line; the occipital protuberance is situated about 8 mm. to the left; the parietal eminences are very asymmetrical, the right being very prominent and of irregular contour; the palatal vault is of medium height, the teeth regular and the maxilla well developed; the measurements are:

Horizontal index	77.8
Circumference	50.3 c.
Posterior demi circumference	28.6 c.
Transverse diam	140.5 mm.
Anterior demi-circumference	21.9 c.
Longitudinal diam	180 mm.
Bifrontal diam.	105 mm.
Bimastoid diam.	126* mm.
Bizygomatic diam.	134 mm.
Root of nose to occipital protuberance	312 mm.
Over vertex between auditory meati	327.5 mm.
Foramen magnum to sup. occipital angle	128 mm.

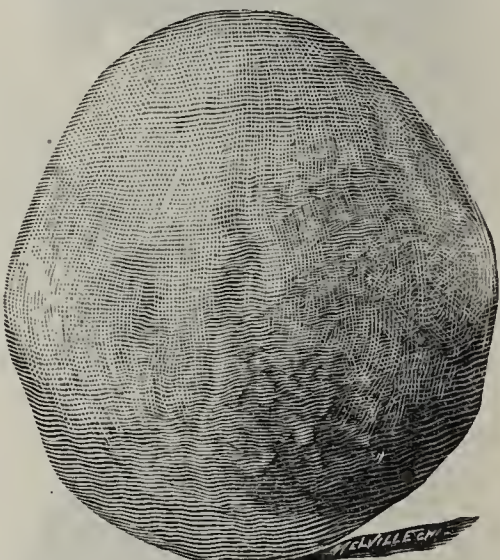


Fig. 35.—Skull of Western Desperado (Brachy-cephalic).

Viewed from above (Fig. 32), this cranium shows a fairly symmetrical outline. The above illustration is used for the purpose of comparison with Fig. 35.

The next specimen is by far the most interesting of the series from the standard of degeneracy, and is certainly the most markedly asymmetrical. If it were possible to conceive of a special criminal type of cranium, this would, in many respects, be an ideal illustration. The subject was a noted Western desperado and train-wrecker, who was lynched at Carbon, Wyoming, back in the seventies, for an attempt to wreck a train at Medicine Bow. In this attempt he was assisted by the individual represented in Figs. 30, 31, 32.

The extremely disproportionate breadth of this cranium is well shown by the above illustration. The meagre development of the frontal region is

very noticeable. On viewing this skull from above, the peculiar twisted appearance which may be observed in connection with the cranial type of the criminal in general will be observed. The orbits are relatively large, and the face, as a whole, of a decidedly "squatty" appearance. The absence of the inferior maxilla is to be regretted, although, considering the vicissitudes which the skull has experienced, its otherwise perfect state of preservation is rather remarkable. After the lynching of this gentleman, the body was buried in a hastily improvised and shallow grave, from which it was very promptly resurrected by those scavengers of the prairie, the coyotes. The skull was finally found by a railroad employé, and subsequently used as a paper-weight for some years.

Judging from the conformation of the cranial and facial bones, the lower maxilla, while probably well, or perhaps excessively developed, was without doubt asymmetrical. The relatively defective frontal development of this skull is its most striking feature when viewed in its anterior outline, and is best shown by comparison with Figs. 12, 13 and 17. In the former the extreme breadth is 122 mm. and the extreme length 196.5 mm., while the frontal breadth is 95 mm. In the skull under consideration, however, although the extreme breadth is 149 mm. and the extreme length but 171 mm., the frontal breadth is only 90 mm. The great disproportion in the measurements is at once obvious. In Fig. 17 the greatest breadth is 131 mm. and the greatest length 181.5 mm., yet the transverse frontal diameter is 95 mm.

The disproportion is not compensated for in Fig. 33 by an increased longitudinal development of the frontal bone.

The twisted appearance of this skull is most evident on comparison of the parietal eminences. These are very prominent on both sides, the left being much the larger of the two; the occipital region is greatly deformed and exceptionally prominent, the bulging being most marked upon the left of the median line. The asymmetry of development is shown by a comparative measurement of the distance of each parietal eminence from the occipital protuberance; this measures on the right side 132 mm. and on the left only 119 mm. The squatty, animal-like type of this cranium is shown by a comparison of its vertical measurement with some of the others of the series; from the highest point at the vertex to the anterior border of the foramen magnum the measurement is 118 mm.; that of Fig. 13, which is so distinctively anthropoid in its development and outline, the vertical measurement is 132 mm.; of Fig. 16, a symmetrical brachy-cephalic type, is 145 mm.; of Fig. 17, 128 mm.; of Fig. 21, 140 mm.; of Fig. 25, 148.5 mm., and of Fig. 31, 136.5 mm. A little study of these measurements

will show the extreme animality of type in this cranium, even as compared with others of a pronounced degeneracy of type.

A view from above (Fig. 35) shows the circumferential outline of this specimen. By comparing the quadrants of this illustration, the pronounced asymmetry of development is easily seen.

The superior maxilla in this skull is well developed, although the alveolar process shows an inferior development; the palatal arch is exceedingly low; the left superior maxilla is much smaller than the right; the palatal processes show great asymmetry, the right being 61 mm. and the left but 5 mm. in breadth. The measurements of this cranium are:

Horizontal index	87.13
Circumference	49 c.
Anterior demi-circumference	20.35 c.
Posterior demi-circumference	28.65 c.
Longitudinal diam.	171 mm.
Transverse diam.	149 mm.
Vertical diam.	118 mm.
Bifrontal diam.	90 mm.
Bimastoid diam.	108.5 mm.
Bizygomatic diam.	132 mm.
Vertical circumference from ear to ear	279 mm.
Center of left parietal prominence to occipital protuberance	119 mm.
Center of right parietal prominence to occipital protuberance	132 mm.
Anterior border foramen magnum to superior occipital angle	128 mm.

ARE INEBRIATES CURABLE?

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Any satisfactory or reliable answer to this question must come from a scientific study of the nature of drunkenness. Fortunately, recent advances of science have furnished many facts and data from which to determine this question, apart from personal opinions and theories.

A very curious chapter of psychological literature could be written on the popular theories of the day concerning drunkenness and its curability. Thus persons who believe inebriety to be a vice and sin, are confident that conversion will cure every one. Many so-called gospel temperance advocates claim to have cured thousands of inebriates, and assert with great emphasis that the grace of God through a change of heart will make sober men of all such persons in all conditions of life. Another class believe drunkenness to result from a weak will power, with absence of plan and purpose in life; the great remedy of which is the pledge. The old Washingtonian revival, the Father Matthew movement, and the blue and red ribbon revival wave, are illustrations of the practical application of this theory. The most wonderful success in the cures of drunkards is claimed by the adherents of this method of treatment.

Many persons proclaim that drunkenness is always due to a wilful criminal impulse, which can only be cured by punishment and suffering. They would have laws for more severe punishment, established the whipping-post, confine drunkards in dungeons in irons on bread and water, and finally use capital punishment. Curiously the believers of this theory cite examples of its practical value in the cure of many cases.

It is clear to many people that the prohibition of alcohol will cure drunkenness effectually. Others assert that drunkenness is a mere stomach trouble, and that specific drugs will destroy the appetite; also, that by treating this appetite to excess of spirits in everything used, a permanent repugnance can be created. A large number of cures are said to be made by these methods.

The drug specific treatment is now quite prominent, but as in many other matters, the results are subjects of faith rather than of demonstration.

These and other theories are proclaimed from the pulpit, platform, and even in the court room, and are scattered broadcast in journals, tracts, and books; and yet all competent authorities agree that drunkenness is increasing. Some reasons for this are apparent in the legal method of curing drunkenness. The fines and short imprisonment, supposed to stop all further use of spirits, produce the opposite effect, and intensify all the conditions which impel the drunkard to drink. Statistics show beyond doubt that the station houses and jails, are more dangerous and destructive than the saloons, that ninety-eight per cent. of all inebriates who are punished for the first time by fines and imprisonment, are re-arrested for the same offense continually until death. There is a grim irony in the method of cure, that makes recovery more and more impossible, and finally completely destroys the victim. Evidently as long as the drunkard is regarded from the moral side alone, and judged by the theories urged a thousand years ago in explanation of his condition, his curability will be doubtful and exceptional.

Another very curious chapter might be written on the spasmodic efforts, through parties, societies, and agitations, to rouse the public to use some curative measures for drunkenness. The literature of these movements is the strangest compound of errors and misconceptions, that are repeated without a question or doubt of their reality. Take the established facts concerning alcohol, they could all be put on a single page, and yet hundreds of volumes and pamphlets have been written on this topic, and these do not include all. A dozen different text books are published, to teach the action of alcohol to school children. Hence it is almost impossible, from any comparison of theory and practice, to form any conclusions as to the actual curability of drunkenness. The scientific student must begin

his inquiries without support from present knowledge, and aside from this mass of opinion and theory.

He must approach the subject entirely from the physical side, and seek to ascertain what drunkenness is, its causes and character, and why alcohol or other narcotics are used so excessively, and beyond all limits of reason and self-preservation. When these facts are understood, the question of curability can be answered. The scientific method to be pursued in this study, is the same as in all other physical problems. First, gather and tabulate the histories of a large number of inebriates, then make comparative studies of these records, and ascertain what facts, if any, are common to all of them. The history beginning with the individual, should extend back to his parents and grand-parents. Giving accurate details of all family diseases and accidents, and diseases which have appeared in different members of the family; also their habits of living, and occupation; their successes and failures in life; their character, conduct, surroundings and longevity. To this add the history of the collateral branches and near relatives up to the present. Then coming to the individual, record all the facts of his birth, and the condition of his parents prior to his birth; his early childhood, diet, diseases; occupation and surroundings, and the culture and cure received. Also all the accidents, diseases, nerve, and muscles, strains, shocks and failures; his culture, surroundings, and all the facts of his life up to the onset of his drink history; the circumstances attending the first use of spirits, and the effects upon him, his habits and mode of living, together with all the circumstances of his life and diet, surroundings, and its failures and successes. The effects of alcohol and its influence over his daily life, and all the other facts of his history. While the accuracy of many of these facts may be difficult to secure, certain general principles will appear, which must have been followed or preceded by certain minor facts, either known or unknown. The more exhaustive these facts are, the more accurate the conclusions. From a grouping of a large number of such histories, a startling uniformity in the causation, development and termination appears. Literally the same causes, the same surroundings and conditions appear in nearly every case. To illustrate, heredity as a causation appears in over sixty per cent. of all inebriates. The parents and grand-parents have been continuous or excessive users of spirits, or have been insane or mentally defective, or have been consumptive, or had rheumatism, gout, or some other profound constitutional disease, before the birth of the child. These physical states have been transmitted, and burst into activity, from exposure to some peculiar exciting cause. In twenty per cent. there will be

found the same history of disease and injury preceding the use of spirits. Thus, blows on the head, sunstrokes, railroad accidents, and injuries which have caused stupor or periods of unconsciousness, or profound wasting diseases, from which recovery has followed, and with it the use of spirits, which sooner or later developed into drunkenness. Mental shocks from grief and joy or other profound emotional strains, are followed by an intense craving and drunkenness. Ten per cent. will give a clear history of brain and nerve exhaustion, preceding the inebriety. In five per cent. bad sanitary surroundings, bad living and diet have been the exciting causes, and in a small percentage the causes are obscure and unknown. These are some of the most prominent facts appearing from a comparison of the histories of a large number of cases. Many of the causes are combined in one, such as heredity, bad surroundings, brain exhaustion, or brain injury. In some cases, old heredities appear in the second generation, or peculiar nerve injuries that develop into inebriety.

Another fact appears from these histories equally startling, viz.: The uniformity of the progress and march of each case. A certain progressive movement is noted along a uniform line of events, that can be anticipated and predicted. Halts, diversions and apparently retrograde movements may occur, but the large majority of all drunkards begin at a certain point, and march down the same road, and cross the same bridges, and arrive at the same termination. To find where the case started and where it is at present is to find accurate data from which to predict the future with much certainty.

Drunkenness often takes on the form of periodicity, in which the use of spirits occurs at distinct intervals. These drink storms, like epilepsy, are followed by a free interval of health and sobriety. During this free interval the victims display mental vigor and great resistance to all exciting causes, then suddenly relapse, and use spirits to excess for a fixed time and recover. Such cases exhibit a strange cycle like movement, coming and going at exact intervals that are uninfluenced by circumstances or conditions. Some are solitary midnight drinkers; others only drink at certain places and at certain times and seasons. Many curious and fascinating facts that are not understood, appear in the history of this class, and suggest a range of causes, yet to be studied.

Such are some of the general facts which are found to be uniformly present in most cases, and which indicate beyond question that drunkenness is a disease. The mental degeneration and obscure forms of physical disturbances, associated with a craving for spirits that dominates every consideration of life, point to a form of insanity, in which both the brain and nervous system

appear to suffer from paralysis and exhaustion. The use of spirits may cause the paralysis and favor the exhaustion which precedes from it. Intoxication exhibits in a concentrated form the common types of insanity, mania, melancholia and dementia, in a brief time. The injury from these states must be very great, and the inference that the demand for spirits is often a symptom and not the disease, is amply confirmed.

From these and many other facts the curability of drunkenness becomes a question of the application of scientific measures and means to conduct or assist the case back to health again. The condition to treat is that of progressive brain and nerve exhaustion, lowered vitality, with damaged and perverted functional activities. The removal of alcohol does not remove the disease, but only one exciting or predisposing cause. Jails isolate and prevent the drunkard from procuring spirits, but experience shows that forced abstinence alone always intensifies the drink impulse, and increases the incurable condition. Something more is required. Enthusiastic appeals to the emotional powers and will, are not curative, because the emotions and will are diseased; the higher moral faculties are perverted and cannot act normally. The drunkard has been switched off the main line of healthy life and living, upon the side-track of progressive dissolution, the opposite of evolution. The question is, what means and appliances can bring him back to the main life of health; can the will power, or prayer, or any specific drugs, or appeals, or threats do it? Are there any agents along the lines of the marvelous, or any miracles that will save the drunkards? The laws of dissolution are as fixed and certain as those of evolution, and the change from the one to the other must be along the line of physical laws and forces, that move without a shade or shadow of turning. The curability follows from the application of certain general principles, the first of which is the isolation and change of surroundings. The drunkard must go into a quarantine, where all the external conditions of life will antagonize his disorder and assist nature to return to health. In a quarantine station or special asylum, the diet, baths, exercise, medical study, and care, with all other means, can be applied with military exactness. Each special phase of disease and form of degeneration can be treated from its particular symptoms, with particular remedies. Nerve and brain rest, the restoration of all the organic and functional activities, can be obtained by means under the care of the medical man. Thus, the drink impulse is overcome and dies away with the increasing vigor of the mind and body. Like insanity, drunkenness is cured, not by drugs alone, but by building up the body, through all the avenues of nutrition, healthful exercise, regulated mental and physi-

cal surroundings, and appropriate drugs. Drunkenness must be recognized as a disease legally, and the victim forced into conditions where he can live along the best sanitary lines of health; where medical treatment and control can be exact and perfect, and where physiological and hygienic training in its broadest and best sense can be applied. The details of the application of these principles will suggest themselves to every one. These principles were suggested for the treatment of drunkenness nearly two thousand years ago, but only recently have they received any special attention. Thirty years ago the first pioneer asylum for the application of them was opened at Binghamton, New York. A furious wave of opposition eventually destroyed it, but the truth which it exemplified was above the superstition and prejudice of the hour. To-day there are over a hundred asylums and houses in the world for the treatment of drunkards from the physical side. Notwithstanding the storm of opposition which greets every new advance in science, and which in this case is not over yet, the success of the asylum treatment has opened a new pathway of great promise for the future. Public sentiment still denies the disease of the drunkard, and legislatures refuse to give legal power of control; and asylums for inebriates must go on as private enterprises, opposed by superstition, without appliances or experience, and treat only the most incurable cases, who come to them as a last resort, and from a forced necessity. The wonder is that any success should follow their crude efforts, and yet the statistics of the largest of these asylums indicate a degree of curability that could not have been anticipated. The first statistical study was made at Binghamton, in 1873. Inquiries were made of the friends of fifteen hundred patients, who had been treated five years before at the asylum. Of eleven hundred replies, sixty-one and a fraction per cent. were still temperate and well, after a period of five years. It was a reasonable inference, that if sixty-one per cent. were still restored after this interval, a large percentage would continue so through the remaining life. Another study of two thousand cases was made at Fort Hamilton, N. Y., which revealed the fact that thirty-eight per cent. of these cases remained temperate and sober, after an interval of from seven to ten years from the time of treatment. In the returns of three thousand cases studied at the Washingtonian Home at Boston, Mass., thirty-five per cent. of all the living persons who had been under treatment from eight to twelve years before, were temperate and well.

In many smaller asylums, both in this country and Europe, where the number studied were limited to a few hundred or less, and the interval or time since the treatment was from four to eight years, the number reported as free from all

use of spirits ranged from thirty-two to forty-one per cent. While these statistical facts are not to be considered as final and conclusive, because they do not extend over a sufficient length of time from the period of treatment, or include a large number of cases, they are full of hopeful possibilities, and indications that cannot be ignored. In view of the fact that many of the asylum cases are largely incurable, and since the faults and imperfections in both the building and management of asylums are unavoidable at present, the curability of drunkenness by this means is more certain than in any other way. The same principle obtains as in insanity—the more recent the case, the more curable; the more complete and thorough the appliances, the greater certainty of cure. These estimates of cure are sustained by all accurate observers, in both Europe and this country, and have become the starting point for most enthusiastic work by many pioneers.

It is a reasonable inference that if one in every three can be cured by the present imperfect methods, a much larger proportion will be restored to health by the improvements and better institutions of the future. It is evident that a large number of all criminals, insane idiots, and defectives come from the ranks of incurable drunkards. If such degenerate cases could only be housed and kept under sanitary control, a visible lessening of these defects would follow. Many other facts sustain the opinion that all drunkards, both recent and chronic, should come under legal control and be put in quarantine asylums, until cured, or be retained for a lifetime. The practical workings of such asylums are assured in many ways, as well as the fact of the curability of a large number of cases, that are literally made worse by the present blundering efforts to improve them. These scientific methods of curing drunkards may be summarized as follows: First, legislate for their legal control, then organize industrial hospitals in the vicinity of all large towns and cities. Tax the spirit traffic to build and maintain such places, just as all corporations are made responsible for all the accidents and evils which grow out of them. Arrest and commit all drunkards to such hospitals for an indefinite time, depending on the resoration of the patients; also commit all persons who use spirits to excess and imperil their own and the lives of others. Put them under exact military, medical, and hygienic care, where all the conditions and circumstances of life and living can be regulated and controlled. Make them self-supporting as far as it is possible, and let this treatment be continued for years if necessary. The recent cases will become cured and the incurable will be protected from themselves and others, and made both useful and self supporting. Who can fully estimate the benefits to society, to morals, and to civilization, by prompt-

ly isolating such persons and keeping them in normal states of living? Who can estimate the relief to the taxpayer by the removal of the perils to both property and life from drunkenness? This is not a theory, but a reality, only awaiting practical demonstration, when the superstitious opposition of public opinion dies away. The time has come to look at this problem in its true light.

The curability of the inebriate is far more certain than that of the insane. The liberty of both is equally dangerous; one is recognized, the other is seldom restrained until he becomes a criminal. The moment a man becomes a drunkard he forfeits all rights to liberty and becomes a ward of the State, and should be controlled by it. It is dense ignorance that permits any one to destroy his life and property by drink on the supposition that he is a free moral agent. The inebriate is mentally and physically sick, and needs the same help as the insane, and the question of care is simply one of adequate means and remedies to reach the disease. The few pioneers working along these frontier lines of research, looking beyond the dust and conflict of temperance agitation, are fully confident that not far in the future the drunkard will be recognized and cured; and the mysteries of the great drink problem will disappear before the march of scientific truth.

STRICTURE OF THE URETHRA. ITS CURE BY PAINLESS DILATA- TION AND BY ELEC- TROLYSIS.

BY GEO. H. SIMMONS, L.M., M.D.,
OF LINCOLN, NEBRASKA.

There are five ways of curing stricture of the urethra, viz.: by divulsion, external urethrotomy, internal or dilating urethrotomy, simple dilatation, and electrolysis. The first named is dangerous, inexact, rude and unsurgical, and is now practically relegated to the dark ages in the history of urethral surgery.

External urethrotomy is associated with more or less danger, but it is an operation that has to be resorted to in many cases.

Dilating urethrotomy has many ardent advocates, and while much can be said in its favor much can be said against it.

In this article, however, I propose to speak principally of the method by dilatation and that of electrolysis, calling attention to the plan I have adopted in dilating with my gleet olives.

I have been in the habit for some years of using Van Buren's steel sound, and it always impressed me that there was a good deal more pain associated with the passing of them than was necessary, considering what was required. The

average patient who comes to the surgeon for relief of stricture, will probably have only one. A few may have several, but the large majority will have but one or two. Such being the fact, what is the use of subjecting the patient to the pain of dilating the whole urethral tract, when the necessity exists only in a very small portion of it. The most severe pain is often felt, and continuously too, at the meatus, where there is no necessity for dilating or cutting, unless it be to admit the sound. And yet this continued stretching is kept up, and the pain associated therewith, from the time the sound enters the urethra until its withdrawal.

Dr. Fessenden N. Otis defines stricture of the urethra as "An abnormal contraction of the urethral calibre at some point at or *between the meatus urinarius and the bulbo membranous junction.*" The same author says that of 258 strictures which he located only 14 extended farther than $5\frac{1}{4}$ inches from the meatus, and only six beyond $6\frac{1}{4}$ inches. Why then is it necessary to use a sound 8 inches to a foot long, extending in many instances several inches beyond the stricture. After the instrument has passed through the meatus, there is usually but little pain until the prostatic portion is reached, then severe pain is felt and considerable reflex disturbance is liable to take place; and both are augmented on entering the bladder. Urethral fever and other troubles are liable to follow when the bladder is entered, or if the sound is pushed beyond the sinus pocularis containing the orifices of the ejaculatory ducts. I have frequently had patients faint when the long sound is passed first, but this would not occur if it were not pushed through the prostatic portion. Epididymitis, with all its *acute* suffering, and *permanent* injury—probably taking away the procreative powers if both testicles should be affected—is a thing to be decidedly feared. And yet every time the sound is passed beyond the triangular ligament we may look for such occurrence, but not otherwise. For these reasons I have discarded the use of the Van Buren sounds and use my gleet olives. The first time I used them was two years ago, on a young man who came into my office, and asked me if I could cure him of stricture, and let him go home in three hours. He was from Kansas, having come to Lincoln on other business, and had to return immediately. I made no notes of the case at the time, so do not remember what history he gave. I examined him and found a stricture back through which a 15 (French) bougie á boulé would barely pass. I suggested cutting with an Otis urethrotome, but he would not listen to it. I did not dare to use electricity long enough to cure at one séance, so concluded to use my gleet olives, which I will describe farther on. I knew it would be impossible to do anything with the ordinary steel

sound, for to break down the stricture with them would be to inflame the whole urethral tract so much, that were it possible it would be dangerous.

In its flabby condition the penis measured a little over three inches, so according to Otis' rule it should take a No. 31 or 32 sound. Having thoroughly cocainized the urethra at and anterior to the stricture, I kept the parts deadened so that no pain was felt during the whole operation except when the larger olives were passing the meatus, which had to be cut before No. 27 would pass. I commenced with No. 17, and forcing it through the stricture immediately pulled it back and so kept moving backward and forward until it would pass easily. I then took No. 20 and followed the same plan, then 22 and then 26. Attempting 27 found that I could not pass the meatus. Having cut this, passed 27, 29, 30 and 32. A little hæmorrhage took place but not much. With much care the instruments were made absolutely aseptic. After the operation I inserted a urethral suppository of iodoform, also gave him some to use at home. The operation lasted barely half an hour, after which the patient rested for two hours in the recumbent position.

When he left he promised to write in a week and later, but I heard no more of him. I was quite anxious about the case and imagined all kinds of terrible things for a while, but finally forgot all about him, until one day five months after operation he came into the office.

He said he had considerable pain for about a week, but in ten days it had all left and he had had no trouble since. Passing No. 30 olive I could find no indication of stricture. The cure was perfect. I have never attempted to cure as bad a stricture, as far as calibre is concerned, at one sitting since, but would not hesitate if necessity required. Since then I have treated several cases with this method, only taking more time, and with success in each case.

The gleet olives referred to were made for me for the cure of gleet with electrolysis, and while I use them in the place of ordinary steel sounds for dilating stricture, and for which purpose I have had them slightly altered, still that was not the idea when I first had them made. They are simply long olives, the smallest No. 17, (French) and three-fourths of an inch long, increasing with gradual gradation to No. 35. Both ends are cone shaped. They screw on to a stiff handle for dilating purposes, or a flexible insulated handle for electrical work. These handles are about nine inches long and can be marked off into quarter inch spaces, for measuring distance of stricture from meatus.

I commenced using galvanism for gleet as a *dernier ressort* in a case of intractible gleet that had been the rounds of the profession in Cincin-

nati before coming west. His history was as follows: Aged 33, stout, phlegmatic, such a character as usually worries but little, but this disease did worry him. Had gonorrhœa four years previous, which was cured in about two months. Some nine or ten months afterwards he contracted another dose, and while the acute symptoms soon subsided it left him with a gleet discharge which continued in spite of everything that had been done. He had been under two or three good men in Cincinnati but without relief. He had been examined for stricture several times, but none had been discovered, and I failed to discover any sign of a contraction. I tried various methods to cure him but all failed. I was then, as now, using galvanism for endometritis, and with success in most cases, stopping the discharge. I determined to try it for this case, so had an electrode made about an inch and a half long and No. 28 French scale—the normal calibre of his urethra.

Having thoroughly cleaned the urethra with retrojection of solution of peroxide of hydrogen, I inserted the electrode, attached to the negative pole of the battery down about to the bulbo-membranous portion. A sponge attached to the positive pole was held over the thigh. I turned on the current till he could just feel it, about three milliampères, and gradually withdrew it, taking between eight and ten minutes to do so.

There was considerable pain afterwards during micturition, but after three days this had all disappeared. There was, however, no change in discharge. On the fourth day I repeated the séance, taking about eight minutes. This too was followed with pain on micturition, but not as severe, nor did it last quite as long. There was lessening of the discharge, but not to a very great extent. Three days after I gave another treatment, and after this some pain, but less severe and quite an appreciable diminution of the discharge. I gave altogether 17 treatments varying from two to five days apart, using from two to seven milliampères, never enough to cause pain. The discharge gradually decreased after the second treatment, and he was discharged as cured nine weeks after commencing the electrical treatment. He remained here six months afterwards, during which time he had no sign of return of the trouble.

During the time the above case was under treatment, a young man about 30 years of age consulted me for gleet. He was in great agony of mind, for he was engaged to be married in October, and this was April. In the July previous, nine months before consulting me, he contracted the clap, and had had a discharge ever since. On examination I found two strictures of large calibre, one and a half and three inches back. He was willing to have them cut, so I cut them with Otis' urethrotome. No trouble resulted except a

little urethral fever. I used my gleet olives for dilating, to keep the strictures from reforming. I waited two months for the discharge to stop, using antiseptic injections, etc., but there was no diminution in the discharge. And the month of October was coming on apace. I advised him to postpone the important event if he could possibly give an excuse, but he said he had none. Having the good results in the case I was treating with the galvanic current, I determined to try it on him. At first the result was discouraging. The discharge did not decrease, but on the contrary increased and set up a more or less inflammation, so that for nearly ten days micturition was very painful. I kept up the treatment, however, every three days, using mild current; after ten days the pain gradually left and at the end of two weeks the discharge stopped almost suddenly. I kept up the treatment about ten days, then stopped, thinking I had cured my patient in two weeks. But I was doomed to disappointment, for in about a week the poor fellow came back blue as ever. The discharge had started on him again but it was slight. I commenced the treatment and after one séance the discharge stopped. But I gave a treatment twice a week for four weeks more, then stopped, as I believed him cured. Six weeks afterward he came in to report that he was going East to get married and settle down there. He thought himself entirely cured, but promised to write if he had any trouble. I have never heard from him, so believe him cured.

Since then I have used galvanism in five cases of gleet. Three of which resulted in a cure. In one after four weeks treatment—two treatments a week—no result could be noticed, and the patient suddenly stopped coming, and I have not seen or heard anything of him since. In the other there seemed to be unusual pain after each treatment, and after three trials the patient would not have it tried again. I have since practically cured him with injections of peroxide of hydrogen and solution of boracic acid.

In reference to the cure of stricture by electrolysis, I have had so little experience compared with others who have written upon the subject that it would be presuming a good deal if I should attempt to take sides against the opposers of Newman and his followers. In more than one case the discussion has gone so far that if the lie was not given it came so near to it that a shadow of a doubt would be felt in the mind of the reader as to whether it was so meant or not.

So without wishing to take part in the discussion, I would say that I have cured five cases of stricture with electrolysis and failed in one. Three of these cases were accompanied with gleety discharge, which was cured in each case. At some future time I propose to elaborate more on my experience with electricity, especially in

urethral diseases and in impotency, but before doing so I want to see the result in cases recently and at present under treatment. In closing I wish to call attention to the advantages I claim for my set of olives. In one set of instruments there is, 1st, a set of bougie à boulé for locating stricture. 2. A set of sounds for curing stricture by dilatation. 3. A set of electrodes for curing gleet with electrolysis, and 4th, a set of electrodes for curing stricture with electrolysis. They were made for me by H. C. Sample, of Chicago.

Of course there is so much more notoriety and surgical ability (?) displayed in cutting a stricture than in curing it by dilatation or by electrolysis, that though the operation is more dangerous and though it does leave the patient with a deformed penis in many cases, it will continue to have the most followers.

But for my part, having tried the different methods, I shall hereafter confine myself when possible to electrolysis and dilatation with short sounds.

I think this will be the opinion, too, of others who will give the method, especially electrolysis, a thorough intelligent trial, provided they understand the use of electricity.

But on the table before me is the May number of the *Western Med. and Surg. Reporter*, and under the heading "Electrolysis," a professor of surgery discourses on the uses of electricity, closing his article as follows: "We would at no time use more than 75 to 100 milliampères for stricture of the urethra." He certainly would not—on the same patient.

CONTAGIOUSNESS AND INCUBATION PERIOD OF SCARLET FEVER.

BY C. G. BACON, M.D.,

OF FULTON, N. Y.

MEMBER OF THE OSWEGO COUNTY MEDICAL SOCIETY; THE NEW YORK CENTRAL MEDICAL ASSOCIATION; NEW YORK MEDICAL SOCIETY AND ASSOCIATION; AMERICAN MEDICAL ASSOCIATION.

For the last forty of the over fifty years of my practice in the medical profession, I have not doubted the contagiousness of scarlet fever. I will give a very few of the many evidences I have had to justify my conclusions. My observations have been over several hundred cases of scarlet fever, and I do not remember of a case where the invasion has been less than the seventh or the eighth day after the exposure. In cases where I have been called to attend a case evidently contracted away from home, and others of the family predisposed by not having had the disease, have advised preparation to be made for the care of the others, that would probably be taken sick in eight days after, and dieting recommended, to commence in six days from the day of exposure, as I have often observed a mor-

bid appetite for one or two days previous to the invasion of the disease.

1. In the autumn of 1849, I visited two sick children of S. Hart's. Had not seen or heard of any case of scarlet fever in the village for some months previous. They were suffering from sore throats, chilliness, nausea, etc. Among other things advised for their relief, were ears of corn put into hot water, taken out, surrounded with napkins and placed to the sides, legs and feet of the children for a short time, or until the chills should subside. At my visit the next morning, the children were covered with the scarlet efflorescence. Ten days after, a child residing in a house adjoining had the disease developed, and soon after the disease appeared in different parts of the village, as there was no strict quarantine observed.

2. The ears of corn mentioned, were the next morning given to the pigs, four in number, weighing about 60 lbs. each. Eight days after eating the corn the shoats were all taken sick, with swelled throats, so that it was with difficulty they swallowed the best prepared food. Their bodies became scarlet, three of them died in from one to three weeks, all apparently suffering all the symptoms usually seen in the human subject.

3. In the evening of the 18th of January, 1868, I visited the son of J. D. L., of this village, O., aged 14. He was suffering an invasion of scarlet fever of the anginose form. He had, on the 8th and 10th, visited a cousin at Baldwinville, twelve miles distant, sick with scarlet fever. At this time there were no other cases in this village. On the 26th two of his sisters were taken sick with scarlatina, one aged 12, the other 8. The 28th inst. his brother Frank, aged 10, and another sister aged 5, were also invaded with scarlatina. All finally recovered.

4. Across the road from this family lived Mr. R. P., whose son I saw on the 6th of February, 1868. He had a chill, nausea, etc., rash appearing on the same day. On the 14th inst. five others of the brothers and sisters were sick, with the disease fully developed, all finally recovering. One of the girls was very sick, and did not swallow food for some days, and finally was fed milk by the aid of a soft rubber hose for two days, introduced into the stomach. During the stage of desquamation of this one, had the skin from the palms of her hands, with two of the nails of her fingers, exfoliated whole or nearly so, which I kept some time as a rare specimen. From this time the disease spread rapidly through the village and vicinity. During the winter and spring I treated 68 cases, and others treated many more. There were five practitioners in the village.

5. Mrs. S. F., a widow, the mother of one son and one daughter, living in the country, went one-half mile and took care of Mrs. Morse's sick child one night (the 13th of February, 1868),

returning home afoot through a deep snow in the morning. On the 21st her two children, not otherwise exposed to the disease, sickened with scarlatina. The girl, aged 4 years, died the same evening in convulsions. The boy recovered.

6. The daughter of I. S., aged 14, attending school at the Falley Seminary in this village, her father's family living one mile in the country, was taken sick and carried home the 2d day of March, 1868—vomiting, febrile irritation, etc. I saw her in the evening at her father's house. The disease developed in a grave form. After a severe sickness she recovered. On the 10th inst. one brother, one sister, and two grandchildren of I. S., living in the same house, were taken with the disease in a milder form—simply, we claimed, owing to care and dieting in anticipation of, or preparatory for, scarlet fever.

7. On the 1st of October, 1878, a son of Prof. W. H. C., aged 6 years, sickened with scarlet fever. On the 8th inst. a sister not otherwise exposed, aged 4, had the invasion of the disease. On the 14th the babe, aged 16 months, was taken ill of the same disease. All recovered.

As this paper is getting lengthy, I will cite no more evidence of the contagiousness and the incubation period at present. I well recollect the time when the contagiousness of this disease was doubted by many in the medical profession. That scarlatina is a contagious disease is generally believed at this time. It is not caused by sewer-gas, cesspools or malaria (neither is diphtheria), although when either of these are present, it does without doubt add to the severity of the disease.

SOME INTERESTING POINTS IN AN UNUSUAL CASE OF ANTEFLEXION, WITH OTHER ANOMALIES.

Read in the Section of Obstetrics and Diseases of Women, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY JULIA W. CARPENTER, M.D.,
OF CINCINNATI, O.

Exceptions are often as valuable aids to diagnosis as rules. Were there no exceptions, medicine would be an exact science, and instead of having only the average result for a starting point in all cases, every diagnosis would be as certain and easy as mathematics.

Prominent among the causes of sterility are anteflexions, extremely small os and conoidal cervix; the last stated by some authors to be the most common of all. Any one of these alone being a sufficient cause, what would be thought of a patient having all three of these peculiarities? Many cases like the following would necessitate rewriting all the text-books.

Mrs. H., 33 years of age, came for an examination for this reason. She was troubled at

times with a cramp and "burning sensation" in the right thigh, in a place about the size of a hand. Having tried various remedies without affording relief, she wondered whether it could in any way be due to some internal trouble. An examination revealed the following conditions: A sharp anteflexion at the junction of the cervix and body, a greatly elongated, conoidal cervix, nearly 2 inches in length, with an os of the very smallest size.

Close questioning elicited the following information: She had never had dysmenorrhœa to any extent, nothing that could be called pain, only a little discomfort at first, and that had grown less each year. She had never had uterine catarrh, nor any symptoms to call her attention to the internal organs. Were it not for the cramps referred to, an examination would never have been thought of. I explained to the patient her formation, and told her the rule was that a person with any *one* of those peculiarities did not have a family, and that having all three, her prospects were not great.

To see whether the cramp complained of was a reflex from some internal pressure, a few weeks' treatment was given, but it made no change in affairs. Electricity applied to the affected limb gave some temporary relief.

A year later she returned for another examination, and was glad to be told she was pregnant. Two other physicians saw her between that time and the birth of her child, and each one spoke to her of the peculiar cervix.

The birth of the child occurred in another city, but the report was as one would expect. The first stage was very tedious, lasting three days, though there were no severe pains.

The contractions of the second stage accomplished nothing. The patient was closely built and fleshy. Instrumental interference proved necessary, with high application of the forceps. The weight of the child was 10 lbs. The mother made a good recovery.

The patient was lately seen again, when the child was 2½ years old. The cervix is now of ordinary length, and a very slight anteflexion exists at the junction of the cervix and body. A laceration on the left side extends nearly the length of the cervix, but there is neither catarrh nor erosion, and the patient says she is in good health.

Another interesting point is that the cramp and "burning sensation" in the limb grew much more severe before the birth of her child, but since that event, it has never returned, indicating that it was without doubt a reflex from the peculiar internal conditions.

SOCIETY PROCEEDINGS.

American Electro-Therapeutic Association.

First Annual Meeting of the Electro-Therapeutic Association, held in Philadelphia, September 24, 25 and 26, 1891.

(Continued from page 889.)

FIRST DAY—EVENING SESSION.

The meeting was called to order at 8:15, with President Massey in the chair.

The first thing on the programme was a paper by Dr. Horatio R. Bigelow, on

EIGHT MONTHS WORK AT THE FREE DISPENSARY FOR WOMEN, PHILADELPHIA.

During the days of my apprenticeship in gynecological electro-therapeutics, now ten years ago, more especially after association with Dr. Apostoli, I saw that for purposes of observation and study, individual clinics were a necessity. In Europe, almost every docent has his own dispensary, giving him wide range of observation and a larger opportunity of weighing evidence than those who depend upon a fluctuating private practice. On January 1, 1891, Dr. Massey and myself inaugurated one clinic for the treatment of the diseases of women by electricity, at 1632 Cherry street. It seemed desirable to have some place where the method of Apostoli could be demonstrated to onlookers or skeptics desiring clinical evidence. Another purpose in view, which the number of cases amply subserved, was accuracy, quickness and honesty in diagnosis; an experience as elaborate as that possessed by most men, and exceeded by none, ample leisure, opportunity, and the desire to learn. A personal observation of six years in many of the large hospitals, public and private, on the Continent, convinced me that gynecological diagnosis was generally a vocative quantity among recent graduates and general practitioners. College teaching was a matter of book lore only; the educated touch came only with ample practice among a large variety of cases, and such a clientele was not always available. These things impressed themselves upon me, embarrassed me, mortified me. I knew of mistakes being made by men nursed upon theory alone, and others by men highly placed as specialists. Not the least that I learned of Apostoli was refinement, scrupulous care and precision in formulating a diagnosis. I consider him the most accurate diagnostician on the continent, and the equal of any of his peers. I was fortunate in having Dr. Massey enter readily into the scheme, for there are many responsibilities and trials in the orderly arrangement of a clinic. We have had, up to this time of writing, 75 new cases—a small number, perhaps, but

LENNOX BROWNE confirms the statement of Couldrey as to the efficacy of sodium salicylate in the milder forms of diphtheria.—*Journal of Rhinology*.

large when remembered how long a time must elapse before such a place becomes generally known, and how loath charity patients are to engage in a new medical department. We have made between 600 and 700 applications, as follows:

Anodal galv. vaginal	275
“ “ uterine	250
Cathodal galv. vaginal	
“ “ uterine	25
Anodal vaginal galv. lahile	1
Bipolar vaginal faradic	4
Puncture through vagina positive	10
“ “ “ negative	45
“ “ abdominal walls	3

These punctures were all for uterine fibroids. Three tumors were subperitoneal, the others mural. There were fifteen cases of fibroids. The mean current strength used for vaginal applications, 35 mm.; for punctures, 85 mm. Five cases of specific, purulent salpingitis, five of salpingitis—and by this, I mean cases which had no specific history, in which there was no cachexia, no hectic, and in which the pains were not important—five cases of salpingo-ovaritis, or cases in which we believed there was a series of pus pockets in the tubes and ovaries. As much as we would like to puncture some of these tubes, in which the drainage to the uterus was free, no pus pockets being present, we were unable to do so, because there were no beds at our disposal. Symptoms are relieved by vaginal applications in simple forms, but cases are never cured. The intra-uterine applications, supplementing the vaginal, do have a marked influence for good, in simple uncomplicated cases, those in which the tubes are not constricted and those forming abscess pockets, and where the dribbling into the uterus has not been interfered with. The cases of large tortuous tubes, with thin and distended walls, irregular swellings, denoting pus pockets, and pronounced cachexia, demand the interference of the surgeon. Electricity can do no possible good—it may do much harm. So one object of a well conducted clinic is differentiation; to know what cases to treat, to realize that there is such a thing as over-treatment, and that electricity is not a panacea for all female pelvic disorders. Some other things are learned. Many tumors appear benefited symptomatically only. Soft myoma, fibroma undergoing degeneration, and subperitoneal tumors, are not benefited anatomically, as a rule. We had one case of a large subperitoneal fibroid—that of Emma Howard—sent us by the County Medical Society, which has been punctured a dozen times through the vagina, without apparent diminution of the growth, and without decided change of symptoms. Locomotion is difficult and painful. This was an unfortunate test case, because subperitoneal growths, being far out of reach, resist the action of the current, and the patient's surroundings are most

lamentable. She is a type of poverty. She lives in filth, is insufficiently nourished and drinks to excess. Confidence in any therapeutic measure should not weaken one's honesty in the recapitulation of results. In this case, Dr. Massey has tried electrolytic puncture with three needles through the abdominal parietes. We know statistics are against this mode of treatment, and I am not convinced that there has been any diminution of the growth of the tumor. It has changed its form from a prominent, dome-like swelling, to a spread out, lobulated lateral mass, somewhat lower down in the pelvis. While abdominal puncture, theoretically, might be proper, the results of operation are against its use. Where the abdominal walls are as thin and transparent as in the case of Emma Howard, where the intestines are not overlying the tumors, and the bladder at a safe remove, I do not see why abdominal puncture may not be given further hearing. All of our cases of fibroids were made comfortable, notably that of Mrs. Clarke, who has a left lateral fibroid low down, and who says punctures only give her relief from the symptomatology. No tumors have disappeared. Two, Hester Wilson's and Mrs. Clarke's, are reduced in size. Under better hygienic conditions and regular treatment, I feel sure we should have better results than is possible in a clinic. Many cases come irregularly for treatment, and are not under constant observation; and all badly nourished and improperly cared for. Small intramural tumors, hard and not very painful, that are taken in hand as soon as noticed, always do well under the buried negative puncture, and I believe may be made to disappear, although I have never seen such a case myself. Inflammation of the adnexæ, old chronic salpingo ovaritis, demand the greatest possible care and dexterity in their management. Of the first importance is accurate diagnosis. It is a *sine qua non* of success, that the electro-therapeutist be a thoroughly competent gynecologist, if he intend limiting his practice to the diseases of women. This can only be acquired after years of work in large clinics where the material is ample, and it would be well for the science and art of medicine if a more enlightened view of pathology should be conjoined to it. We ought to know all about the processes giving rise to abnormal conditions, that we may have a clear conception of the limits and degree of acute inflammations, and of the nature and extent of degenerations. Otherwise we grope in the dark, and our labors will be in vain. Pathology is far too commonly neglected. In acute diseases of the adnexæ, the introduction of a sound, even in competent hands, is apt to create mischief. Not only is the lining membrane of the tubes in a hyperæmic and hyperæsthetic condition, but the whole endometrium, and it is bad practice to resort to any measure which shall in-

tensify such pathological processes. In some chronic states this may hold true. I believe the reputed cases of active inflammation of the peritoneum after application of intra-uterine current have been so caused. I have recently had one case myself. I knew better, and operated much against my better judgment, and my patient had a fight for life for many weeks. It was a bad case of salpingo-ovaritis, in which I advised surgical intervention, because I felt that nothing but the knife would give permanent relief. But the patient would have none of it. I gave her the application within the uterus of 30 mm., which was well tolerated, but it awoke the fires at once, and I had a hard battle for eight weeks. It has taught me a lesson. Hereafter I shall inaugurate the treatment in such cases by vaginal applications of great delicacy, until I am satisfied that the patient's uterus will be tolerant of a foreign body, and in all cases of extremely tortuous or constricted tubes I shall decline to interfere. I firmly believe in the value of electricity in gynecology; I am as ambitious for it as any one can be, but I realize that incompetence, immoderate enthusiasm and faulty differentiation are to be avoided. I know electricity is employed in diseases of women by those who have not the requisite experience, nor the modesty, for its successful employment. I repeat what I have often said, that faulty complications do not happen to competent electro gynecologists, and I refer any one interested to the report of the commission appointed by the Academy of Medicine of Paris to investigate the fatal results in the practice of electro gynecologists, which will be found in the July number of the *Revue Internationale d'Electro-thérapie*.

As to the question of adhesions. Any inflammatory process in the pelvis will be followed by some effused lymph which may formulate as an adhesion. In fact almost all tumors I have seen operated upon were complicated with adhesions, and these too happened in countries where electricity had never been employed. The thoughtful student will see that such an objection cannot possibly hold, excepting the case I have cited. We have had no bad results in our clinic. One interesting case came to us from Dr. Thomas of New York. The late Dr. Schroeder, of Berlin, diagnosed an exudate, so did Carl Braun, of Vienna. Dr. Joseph Price of this city opened the abdomen, but did not complete the operation, because he did not have the patient's permission to do a hysterectomy. Dr. Thomas diagnosed an intra-mural fibroid. The woman is exceedingly fat, the vagina long, and an exact diagnosis is arrived at with difficulty. There is apparently a small tumor, but there is also an exudate, through which one can make out the tumor. The left lateral fornix is filled up with a boggy mass, extremely sensitive; the tube can-

not be felt, and I am not sure that I made out the ovary on that side. She has frequent attacks of severe pelvic pain. Coition is always painful. At her menstrual periods she has great suffering. We have been treating her unsuccessfully with vaginal applications. We now commence the intra-uterine application, because I find a sound is well tolerated. Another subject which I would touch upon. We are over-inclined to judge of the work of surgeons engaged in abdominal surgery, either from inadequate observation or from a study of those cases only which come under our personal observation, or from discussions in medical societies, or worse still, one's conclusions may be drawn from the unsound reasoning of a one idea personality. I believe many tubes and ovaries are removed without sufficient cause, but these instances are not often out of the record book of those competent to practice abdominal surgery, but usually are the belongings of a young ambition, anxious to climb. Surgery is handicapped with incompetent practitioners just as our own specialty is, and it is not one more logical to lay miserable failures and mistakes at the door of honest surgery, any more than for surgeons to conjure all sorts and conditions of doubts and to hold the responsible intelligences among electro-therapeutists responsible for engendering them. We must remember that eminent surgeons see a class of cases, and those in large numbers that rarely if ever come to smaller clinics. Cases in which nothing but operative interference could be of the least service. So we may not wonder that surgeons arise in their wrath, when lesser lights, who know little or nothing of such aggravated forms of disease, dispute the necessity of operating. The cases that I have recently seen operated upon by Dr. Joseph Price, were those of enlarged constricted tubes, an abscess in fact between each constriction, with an abscess in the ovary. Electricity could do nothing. Neither would an expectant plan of treatment be of service. Electricity would be most pernicious because only one pus pocket could be reached. I know there are now, and always will be, cases which will not be benefited by electricity, and one of our greatest dangers is the over claiming of young and restless men among us, and the unequivocal condemnation of honest intelligent surgery by those who know little of either abdominal surgery or electro-therapeutics. We will gain nothing but enlarged advertising by the loss of dignity and self-respect that must come from the unseemly debate that sometimes happens in our medical societies. Personalities are offensive, and are not arguments. Honest surgeons do not rail at us, but they do object to inexperienced gynecologists and unlettered electro-therapeutists claiming marvels for a method of which they can know little or nothing. And they have a right to ob-

ject to the criticism of men who know nothing of pathology. I deprecate the tone of recent discussions in special societies. I shall keep on doing my work in electro-therapeutics in the best way that I can, and I expect surgeons to believe that I am acting intelligently and conscientiously. I have served a long apprenticeship both here and abroad—quite as long as any of them—and I say it with modest intent, I feel quite as competent to judge of the necessary treatment in certain cases, as they. They must not impugn my motives, they cannot impugn my intelligence. I know that a study of electricity is fraught with difficulty and is not to be had for the asking, and I know too that there are very few operating surgeons who know anything about it. Therefore they are not competent witnesses.

(*To be continued.*)

Southern Surgical and Gynecological Association.

Fourth Annual Meeting, held in Richmond, Va., November 10, 11 and 12, 1891.

(*Concluded from page 893.*)

NOVEMBER 12, THIRD DAY—MORNING SESSION.

The Association was called to order by the President at 10 A.M.

Dr. James A. Goggans, of Alexander City, Ala., read a paper entitled

ABDOMINAL SECTION IN A CASE OF CYST OF THE MESENTERY.

He stated that he had been induced to write a paper on the case from the fact that cysts of the mesentery are extremely rare, and that operations for their removal are most generally fatal. He said that he had been able to find the record of one case of cyst of the mesentery removed by enucleation by Guyon. The patient died on the seventh day after the operation. One case operated upon by Sir Spencer Wells—the operator in that case incised and drained the cyst, but the patient died within a few weeks. Three cases operated upon by Péan, only one of which recovered. One case operated upon by Watts, but that he did not know the result in the case. One case operated upon by Cortes, who incised and drained the cyst, but the patient died from septi-cæmia and hæmorrhage. One case operated upon by Bantock, who removed the cyst by enucleation, and the patient recovered. The conclusion arrived at as to the origin of the cyst in that case, both by Dr. Bantock and the pathologist who examined the specimen, was that it originated from some foetal structure, possibly some of the rudiments of the permanent kidney. He said that Dr. Greig Smith says that he knows of two cases of mesenteric cyst removed by opera-

tion by his friend, but that he could not relate them to him, as they had not yet been published. He said that the patient upon whom he had operated for a cyst of the mesentery was a young woman, 21 years of age, daughter of a physician of Columbus, Ga. She had not been well for two years, but did not know that her abdomen was becoming larger until three months before the operation. During those three months she had been treated for abdominal dropsy, and had suffered much uneasiness and pain in the abdomen, and at the time of the operation her pulse was 120, and temperature 100° Fahr. The cyst was quite large, occupied mostly the left side of the abdomen, extended from under the ribs into the left lumbar region, dipped downward into the pelvis, and extended 3 or 4 inches beyond the median line of the abdomen into the right side. He said that he first removed about a quart of the fluid by aspiration on February 7, 1891. The fluid was thin and of a dark color, and contained albumin, phosphate and chlorides. The patient was not benefited by the operation, and the abdominal section for the removal of the cyst was made on February 24, 1891.

The cyst was covered with omentum and mesentery, and loops of small intestine were embedded in its walls. An attempt was made to enucleate it, but hæmorrhage was so free that the idea of enucleation was soon abandoned. A point as remote as possible from blood-vessels and intestines was selected, the cyst incised and drained. More than one gallon of a thin, dark-colored fluid was evacuated, the sac irrigated with hot water, the lips of the incised sac stitched to the upper angle of the abdominal incision, and a glass drainage tube introduced to the bottom of the cyst. The abdominal incision was then closed with silkworm gut sutures. The author was confident that the cyst was retroperitoneal. The time consumed in the operation was twenty-five minutes. The sac was irrigated three or four times in the twenty-four hours, and the drainage tube gradually withdrawn. The patient suffered much from nausea and vomiting, which he attributed to the close connection between the walls of the sac and the loops of small intestine. The patient made a good recovery within thirty days. He presented a picture of the patient which was taken the 1st of November, 1891, which showed her to be in perfect health.

THINNESS OF UTERINE WALLS SIMULATING EXTRA-UTERINE PREGNANCY, WITH REPORT OF TWO CASES,

was the title of a paper by Dr. Geo. J. Engelmann, of St. Louis, Mo.

The author said there are many difficulties in the way of a positive diagnosis of early pregnancy, even in cases surrounded by conditions less unusual, but they assume alarming propor-

tions when aggravated by the curious complications which may arise in individual cases, and above all when conditions are simulated in which delay is dangerous and operative interference seems called for, when a decision is urgently demanded, a decision upon which a life, and perhaps two, may depend. Whilst the auditor may criticise at his leisure, and readily differentiate the conditions depicted, it is only he who is to pronounce and to act who can realize the difficulties of this so entangling and knotty a problem.

Case 1.—Patient, 32 years of age, had borne three children in the six years and a half of her married life, the youngest 20 months old, which she was still nursing, and the menstrual flow has not as yet reappeared since the birth of this child. The patient came to his clinic for relief from a variety of discomforts from which she had been suffering more or less for the past three months. She complains of sick headache, vomiting spells, fulness of the stomach, belching after meals, and an intermittent swelling of the abdomen, a pain in the groin, appearing before such swelling, and a small tumor above the right groin, which she had first noticed three weeks ago, and as she stated, then suddenly made its appearance. An examination revealed large varicose veins over the lower limbs, a solid, round, movable tumor above symphysis and right groin, the cervix low and large, the uterine body thickened, lying low in the pelvis, with a certain mobility independent of the superimposed tumor, an applicator entering $3\frac{1}{2}$ inches slightly *ante*. Notwithstanding the wine color of the pronounced cystocele and the cervix, pregnancy seemed out of the question, and the tumor was diagnosed as most probably a dermoid of the right ovary, hardly one connected with the uterine wall. In the course of an examination two weeks later, a very different condition of affairs was revealed. The tumor had disappeared, and a foetus was found in the utero-vesical space, freely movable, apparently floating about, the small parts being distinctly felt as if underneath a wet towel, both through the vaginal and abdominal walls. So distinct did the small parts appear to the examining finger, that it seemed impossible to realize that even as much as a thickness of the vaginal tissues should intervene, and the abdominal walls must certainly have been very much attenuated to disclose the foetal parts with such distinctness. Probe showed the uterine cavity free, $6\frac{1}{2}$ inches in length, still slightly *ante*, but never curving forward in the direction of the previous tumor.

The treatment for the supposed subinvolution was discontinued, the patient warned to keep quiet, and to notify Dr. Engelmann upon the occurrence of any abnormal symptoms. He believed the case to be one of ectopic gestation, either within the broad ligament or in the ab-

dominal cavity, after tubal rupture marked by the sudden appearance of the tumor five weeks ago, yet he was not sufficiently positive to warrant the immediate resort to the knife, and well that he did not do so, as persistent treatment and repeated examinations resulted in labor pains, and the delivery of a five months foetus in the most correct and natural manner.

Dr. Robert T. Morris, of New York, contributed a paper on

THE REMOVAL OF NECROTIC AND CARIOUS BONE WITH HYDROCHLORIC ACID AND PEPSIN.

The author said sometimes it is desirable to remove dead bone without subjecting a weak patient to a dangerous or deforming operation. Attempts have been made with some success at clearing out this bone by a process of decalcification, but there are two chief reasons why failures have resulted as a rule. In the first place, it was discovered that superficial layers of dead bone were decalcified easily enough, but the acids did not reach deeply through the mass, especially if portions were infiltrated with caseous or fatty debris. In the second place, cellulitis was pretty apt to develop during the course of treatment.

After much experimentation, he had finally adopted a method of work which seemed to be complete. An opening is made through soft parts by the most direct route to the seat of dead bone, and if sinuses are present, they are all led into the one large sinus, if possible. The large direct sinus is kept open with antiseptic gauze, and the wound allowed to remain quiet until granulations have formed. Granulation tissue contains no lymphatics, and absorption of septic material through it is so slow that we have very good protection against cellulitis. The next step consists in injecting into the sinus a two or three per cent. solution of hydrochloric acid in distilled water. If the patient is confined to bed, the injections can be made at intervals of two hours during the day; but if it is best to keep the patient up and about, the acid solution is thrown into the sinus only at bed time. In either case, the patient is to assume a position favorable for the retention of the fluid. Decalcification of exposed layers of dead bone takes place quickly, and then comes the necessity for another and very important step in the process. At intervals of about two days, an acidulated pepsin solution is thrown into the sinus (he uses distilled water, 3iv ; hydrochloric acid, m. xvi ; Fairchild's pepsin, 3ss), and this will digest out decalcified bone and caseous and fatty debris in about two hours, leaving clean dead bone exposed for a repetition of the procedure. The treatment is continued until the sinus closes from the bottom, showing that the dead bone is all out.

Even in distinctly tuberculous cases the sinuses will close if apparatus for immobilizing diseased

parts and tonic constitutional treatment are employed, as they should be, in conjunction with our efforts at removing the dead bone. If suppuration is free in any cavity in which we are at work, it is well to make a continual practice of washing out the cavity with peroxide of hydrogen before each injection.

It is a popular impression in the profession that living bone is not attacked by dilute mineral acids, but as it makes a good deal of difference whether the impression is correct or not, he experimented as follows: A portion of the keratinoid layer was removed from the carapace of a turtle (*nanemys guttatus*), and the animal was then placed tail downward in a glass of five per cent. hydrochloric acid solution. In the glass he placed also a segment snipped from the plastron of the turtle, and a transverse segment from an old dry humerus of a man. The piece of humerus was completely decalcified in six hours; the segment from the plastron was soft in about twenty hours, and the carapace of living bone was decalcified at the exposed part in thirty hours. He was then curious to know what effect the acid had had upon the blood vessels of the decalcified bone, and Dr. Smith, of the laboratory of the Post-Graduate Medical School, made for him several sections of the carapace, which included both decalcified and healthy bone. Investigation showed that all of the blood vessels were destroyed wherever the bone was softened, and the action of the acid had extended farther up along the larger blood vessels than elsewhere.

The difference in time between decalcification of the dead bone—six hours—and of living bone—thirty hours—is significant; a five per cent. solution of the hydrochloric acid having been used. If we use a two or three per cent. solution of hydrochloric acid, a wall of lymph and of granulation tissue is thrown out upon the surface of the living bone for protection, and only dead bone is attacked. This, at least, has been his observation in several cases in which the results of treatment could be easily watched.

Dr. Landon Carter Gray, of New York, in a paper entitled

THE PRESENT STATUS OF CEREBRAL SURGERY, touched upon the modern aspect of intra-cranial surgery. The speaker first passed in review our present knowledge of localization of functions of the brain, stating that we were well acquainted with the functions of the motor area, of the third frontal convolution, the frontal lobe, the island of Reil, the two upper temporal convolutions, the cuneus, certain portions of the basil ganglia, the base of the brain and the cerebellum, and that we knew nothing, or had still under discussion the question of the localization of the centers for the sensations of touch, pain, muscular sense, temperature sense, most of the parietal

lobe, and most of the temporo sphenoidal lobe, with the exception of the olfactory lobe. He stated that operations for fracture of the skull with or without hæmorrhage, for abscess, and for tumors that were removable and localizable, were usually successful; those for so-called idiopathic epilepsy were utterly valueless, as were also those for epilepsy supposed to be due to genital or ovarian irritations, whilst those done for epilepsy due to removable and localizable lesions of the intra-cranial contents were usually successful so far as the lesion was concerned, although it was a grave question as to whether the epileptic habit was ever cured; the latest operation for idiocy supposed to be due to premature ossification of the fontanelles was still under discussion and consideration, the cases being too few and too recent to permit of any conclusion, while the operations for hydrocephalus and for epilepsy due to such early infantile and foetal lesions as porencephalus, hæmorrhage and meningitis, were indefensible. He further impressed upon surgeons the great difficulty that there often was in finding a sub-cortical lesion of the centrum ovale that was deep-seated or small, and the fact should be borne in mind that there might be no decussation of the motor fibres from the hemispheres, so that a lesion would be found upon the same side as the paralysis.

Some Complications of Psoas Abscess.—This was the title of a paper read by Dr. McF. Gaston, of Atlanta, Ga.

THE ANTISEPTIC ACTION OF SALOL.—As the result of a series of experiments with salol, Dr. F. Papuli arrives at the following conclusions:

Salol has pronounced antiseptic properties, especially against certain microorganisms. Its antiseptic action is due to its decomposition, which is produced by the microorganisms themselves. All microorganisms decompose it, but those which decompose it the most actively lose their vitality, while those which only partly act upon it become attenuated, and finally, those which influence it but slightly remain active.

Finally, salol has an important influence upon suppuration. Although this was well known in medical practice, as, for example, in cystitis and pyelitis, as well as in surgery, these experiments would seem to present a clear explanation of its favorable action. While all the writers in their publications speak in general of an antiseptic action, and Gratzel of a detersive and exsiccating influence, from experiments, one comes to the conclusion that the antiseptic action of salol upon suppuration consists in the property which pyogenic microorganisms have in decomposing it and remaining inactive after its decomposition. Its action upon the surfaces of wounds may be considered as double; the salol in the inferior stratum decomposes and renders the cause of suppuration powerless; while, in the superior, salol being, like iodoform, insoluble, it protects the wound from external agents, remains unaltered in the secretions of the wound, while those secretions which contain microorganisms are disinfected.—*Annals of Surgery.*

WHITE of egg is said to be an efficient application for sore nipples.

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SATURDAY, DECEMBER 12, 1891.

RUPTURE OF THE UTERUS.

This appalling accident, although, fortunately, rare, happens with sufficient frequency to make it a matter of concern to all obstetricians. Particularly is it desirable to remember the conditions most frequently leading to it, and to be familiar with such premonitory signs as are occasionally afforded.

DR. J. M. WITHROW, of Cincinnati, has reported, in the last number of the *Lancet-Clinic*, a case apparently unique in some particulars, and which emphasizes with unusual force the part played by ergot in this disaster. Hastily summoned to see an obstetric case, he was informed, upon his arrival, that the woman was dead. Finding a suspicion of heart movement, he immediately gave a hypodermic injection of tincture of digitalis; then examined *per vaginam*, and found the cervix fully dilated, and the vertex presenting, but not engaged. The pelvis was roomy and the head small, so that in about five minutes delivery by the aid of the forceps was effected. The child was a male, weighing five pounds, and was dead; in fact, had been dead for some time, the skin easily slipping off. After removing the placenta, he was much surprised not to be able to find a rupture of the uterus, which he had suspected. The patient, a healthy

woman of 37, had reached full term with her seventh child. Labor commenced at 1 P.M., at which time the midwife was sent for, who stated that the "womb wasn't open." At 3 P.M. she returned, and, finding the womb still closed, gave the patient, according to the statement of a neighbor, a teaspoonful of a dark liquid, which she said would hurry up the pains. Soon after this, she had "one long, hard pain," of which she loudly complained, and not long after that she began to faint, which she did frequently until she died, at 7.30 P.M. The midwife denied that she gave the patient any medicine, but the statement of the neighbor, taken in connection with the resulting symptoms, and the fact, according to DR. WITHROW, that the administration of ergot is an almost uniform practice among the midwives of that city, will leave but little doubt in the minds of practitioners on this score.

Seventeen hours after death an autopsy was made. To use DR. WITHROW'S words: "The tissues were almost completely exsanguinated. Upon opening the abdomen, the peritoneal cavity was found full of free blood and clots, which measured ten pints. The uterus presented a most extraordinary spectacle. It was ruptured from a point on the anterior surface midway between the points of insertion of the Fallopian tubes in the median line, extending up over the fundus and down the posterior wall clear into Douglas' fossa, a distance, even in the collapsed and empty uterus, of nearly twelve inches. The general direction of the tear was straight, but the edges of the split were decidedly ragged. The strange part of the injury, and peculiar to this case, so far as has been ascertained, is the variety of the incompleteness of the rupture found in this specimen. The mucous membrane of the uterus was not torn through at any point, but the peritoneal and muscular layers were severed through the entire length of the rupture. This accounts for my failure to find a rupture by introducing the hand after delivery. When the uterus was taken out it was filled with water, which it held without a leak."

The uterus ruptures when the force of its contractions become greater than its resistance. The etiological factors therefore are to be found in the conditions which stimulate the uterus to excessive effort or conditions which diminish the

strength of the organ. That the latter element is a particularly important one, is shown by the fact that the great majority of ruptures occur in late confinements, especially the fifth or sixth, when it may be presumed that the uterine tissue has lost some of its original tensile strength, even if definite changes can not be demonstrated. In some instances excessive fatty change of the muscular tissue has been shown to exist. It has been found to occur in the cicatrix of a Cæsarean operation. It is hardly possible that without some such essential weakness the uterus could ever be stimulated to such excessive action as would produce rupture. In an overwhelming number of cases mechanical obstruction to the birth of the child is present. These obstructions are to be found in contracted pelves, particularly those in which sharp spinous deformities exist; in cases of unusually rigid cervix; in malpresentations; in excessive size of the child. It has occurred so frequently with hydrocephalic children as to make this condition one of peculiar danger to the mother on this account.

In DR. WITHROW'S case, however, the child was small, weighing only five pounds, and the pelvis was roomy, and had afforded a sufficient outlet to six previous children, and the presentation was normal, so that excessive uterine action from mechanical obstruction could not be blamed for the result. The uterine stimulant was supplied, however, artificially by the ergot, and this agent produced a contraction so long and so violent as to cause the rupture. Why the ergot contraction should result in rupture rather than in the expulsion of the child, in the absence of mechanical obstruction, is not at first clear. But the open cervix found by Dr. WITHROW, several hours after the accident, was not the condition at the time when the midwife administered the ergot. Immediate dilatation of the cervix was not possible, and the weak uterine walls gave way. The hard small parts of the foetus, the knees, feet and elbows being against the uterine walls. According to MADAME LA CHAPPELLE, "some of the muscular fasciculi act in the wrong direction, whilst others, finding a firm support, contract with greater energy." Hence, even with an open os, rupture may occur under ergot stimulation.

The estimate of HARRIS that rupture of the

uterus occurs once in about 4,000 labors, is probably very much under the truth, and the accident should not be regarded as too rare for ordinary consideration, but the possibility of its occurrence should always be borne in mind when predisposing factors are present. When rupture is imminent, the uterus should be emptied as quickly as possible, but it should not be forgotten that the additional tension, following the application of the forceps or the introduction of the hand in the uterus for turning, has been the immediate cause of the accident. Craniotomy is less dangerous under these circumstances than the simpler operations. The case reported by Dr. WITHROW is peculiar in the character of the rent, which prevented certain of the classical signs, recession of the head, and flattening of the bag of waters, from showing themselves. Its great importance, however, is the clearness with which it illustrates one of the dangers of ergot.

RESTRICTION OF IMMIGRATION.

The continuous rapid increase of immigration to this country furnishes our Nation's statesmen with a subject worthy of their most profound consideration. The number of immigrants from 1789 to 1820 was 225,000; 1820 to 1830, 143,400; 1830 to 1840, 599,100; 1840 to 1850, 1,713,200; 1850 to 1860, 2,598,200; 1860 to 1870, 2,466,700; 1870 to 1880, 2,944,600; 1880 to 1890, the enormous number of 5,176,200, the vast majority of whom seek homes or places of habitation in the cities, and this particular city is said to be receiving of this number now, more than 60,000 per annum, while the whole number of 5,176,200 is equal to one-twelfth of the entire population of the United States, and greater than that of the second State in the Union, and more than three times as great as the Nation's metropolis. When we contemplate the character of these immigrants, we are appalled and shrink from our own thoughts.

The first settlers of our land were people who came here, perhaps most of them, to escape the intolerance of religious persecutions in other lands. To them this was a haven of rest. From these early settlers sprang the men and women who have to this time been the governing body of American citizens. They abjured a State church, and established free schools. On these

two substantial corner stones they erected the governmental superstructure of this great Nation. The fame of the free republic was wafted across the ocean, and into every palace and hamlet.

The educated people of other lands looked upon this experimental republic as a menace to monarchical existence. The poor and ignorant heard the glad tidings of the land of the free, and longingly waited for the time when they could enjoy the blessings of so free a land.

In monarchies there are no free schools, which means very much, for where ignorance prevails, vice and crime go hand in hand. And these poor, ignorant people, who are superstitious, vicious and criminal from inheritance and association, look to America as the land where it seems to be as free for them to do wrong as to do right. This was and is with them the sole motive thought, while with their respective Governments, it has been regarded as brilliant statesmanship to get rid of those who were and are only a menace or an expense; a menace, if healthy in body, and an expense if diseased in either mind or body. Hence, we have our hospitals, asylums and benevolent institutions of all sorts filled with foreign born paupers who have, in many instances, never earned a week's board—in fact, are brought direct from almshouses and infirmaries, assisted by either friends or the paternal monarchical Governments, to this country, where they are quickly housed in our great public carcansaries.

But these are not of the worst class, although they do bring with them infectious, loathsome and incurable diseases, but the vicious and criminals. Men and women who are ready to sow seeds of anarchy and communism, falsely believing it right to do wrong, they are of the Mafia and kindred societies.

Foreign armies are kept up not so much from fear of neighboring nations, as from a fear of the element, that go to constitute their own several nations. Young men at the age of enthusiasm, when their blood is warm, and should be most actively engaged in the industries of life, are made conscripts and kept in the army until the edge wears off, and their ardor quenched, having out their time, they are too old to go into evolution and have had the drill and discipline make them reverence the King and Nobility.

Wisely and none too soon our last Congress enacted a most wholesome immigration law, which went into effect last April. The purport of this most righteous Act is to shut out all immigrants suffering from infectious and incurable diseases.

It is believed, that the act is sufficiently strong to prohibit some of the undesirable elements which under the old law were free to enter. One of the peculiar features of the new act is that it does not recognize an immigrant as landed until he has been passed by the Landing Bureau of a Department of the Treasury. The steamship companies are thus made the custodians of all persons who are denied entry for physical reasons; and they become responsible for the care and maintenance of those persons so long as the importing vessel remains in port, and on her departure she must take away the rejected material. As a natural consequence the companies have advanced their rates for steerage traffic, which, of itself, will tend to purify the stream of immigration. Another salutary influence of the new law is that the steamship companies will become more cautious about the class of people they permit to come to this country on their vessels, and it may lead up to a preliminary physical examination on both sides of the ocean, by competent medical inspectors. When this good end shall have been accomplished, a very weak spot in our international relations will have been touched—a spot that has repeatedly pointed out in our medical and sanitary publications.

In British America, medical attention has been turned to the frequent importation of leprous cases from Asia. Medical men have recently investigated such cases at Victoria, British Columbia, and have recommended that their increasingly rapid importation should be checked by legislation. It is stated that there has been a considerable spread of the disease during the last year in nearly all the Pacific cities of the Dominion, and has reached a point where its further advance must affect disastrously the prosperity of British settlements there.

At the last meeting of the American Medical Association the proposition to add a medical officer to the cabinet was freely discussed, and much has been said in its favor. To our mind, the urgent need of such an officer is shown if he

is to deal with no other subject than that of immigration, a question fraught with mighty consequences to this Nation, and beside which questions of war, famine and trade sink into comparative insignificance.

NATALITY IN FRANCE IN 1890.

It is well known that the natality in France has been diminishing since the beginning of the century, but the year 1890 was marked by an unusual decrease in the number of births. Dr. ADOLPHE BLOCH, of Paris, has sought an explanation for this in the epidemic of grippe of that year.

The number of births in every department without exception was less in 1890 than in 1889. In *La Bretagne*, for example, there were 71,867 births in 1889, and only 68,283 in 1890. The number of illegitimate births as well as the legitimate ones has diminished, being 2,777 less in 1890 than in 1889.

The greatest intensity of the grippe occurred in Paris during the months of December, 1889, and January, 1890, so that its greatest influence on natality should be found in the months of September and October, 1890. According to the statistics of J. BERTILLON, the number of births per year per 1,000 in Paris for the several weeks of September and October, 1890, varied between 18.10 and 23.80, while the average figure for the whole year was 26.90. Comparing these figures with the year 1891, which in consequence of the diminishing natality of the century, should show a slight decrease, it was found that the corresponding figures for 1891 varied between 23.27 and 27.25. The figures for illegitimate births, calculated per 1,000 marriageable women between 15 and 50 years of years of age, per year, showed corresponding relations. In 1890 the weekly variations during September and October were from 32.99 to 44.97, while in 1891 they were from 43.79 to 53.40. These figures show very conclusively that the grippe was largely responsible for the extraordinary and unusual diminution in natality in 1890.

DR. FRANK W. REILLY, of Chicago, formerly a surgeon in the Marine-Hospital Service, has been appointed Secretary of the Illinois State Board of Health.

DOMESTIC CORRESPONDENCE.

Alcohol. The Other Side.

IN THE JOURNAL of November 28, Dr. Chenery, of Boston, tells what he knows about alcohol, and the article shows that he is well posted on the subject, but I am persuaded from its perusal that the Doctor has entirely ignored the good alcohol will do in disease. His aim in writing the article was to show how much evil it would do, and this way of writing up an article is not right. Nearly all writers, it does not matter on what subject they are writing, have a point to make, and to do this they sum up all the testimony they can get to make their point, but they rarely say anything that would likely destroy the force of their argument. Dr. Chenery admits that alcohol is an anæsthetic, but for fear some one will use it for that effect he immediately tells us that ether and chloroform, etc., are much better, and not so seductive. But the doctor fails to tell us how or why they are better. His sole aim was to jump on alcohol and to make its character as a remedy so hideous that doctors would not use it. But alcohol has helped too many practitioners out of close places for them to turn it loose simply because it has power to do harm. Dr. Chenery could take up any remedy that is a poison and could say all the evil things of it that he has said of alcohol. Any one knows that all poisons are destructive. He could take opium and say just the same things of it that he has of alcohol, but the profession will not give up opium as a remedy simply because its wrong use kills people or makes them crazy. Every physician who has had any practice knows for himself what alcohol will do in emergencies, and when these emergencies arise he would not be without it for any reasonable consideration. You may preach that it is poisonous, and seductive, and dangerous, and all that, but when the proper indication arises for its administration the conscientious physician will give it, and the suffering patient will thank him for it. An anæsthetic, one that will ease pain and not kill, alcohol that kind of a remedy? When a man is dying for want of an anæsthetic, when his heart's action is feeble that his pulse is imperceptible, would you substitute chloroform or ether, nitro-glycerine or nitrate of amyl, when you knew that in alcohol you had a known and tried remedy, and one that would not disappoint you nor injure your patient? When a human life is at stake give what you know to be best for your patient, and not let some fine-spun theory of alcohol's effect on blood cells cause you to try something you know nothing about. Of course if you have tried all the substitutes that Dr. Chenery suggests, and find them more appropriate and less dangerous, you will give them, but until you have reached this (to me) very doubtful position, give alcohol. To show how extreme Dr. Chenery is on the question of alcohol, he would advise us to go back a quarter of a century and take up the lancet. Does Dr. Chenery know what effect blood-letting has in the treatment of pneumonia? Has he ever tried it? If not, how does he know that it would be an improvement on the alcoholic treatment? Now my object in commenting on the doctor

article is not to prove that his theory of the effects of alcohol on blood-cells is erroneous, but it is simply to warn readers of that article not to jump at the conclusion because alcohol is capable of destroying the human frame in its entirety, that it is no account as a remedy. If you recollect, it has been said of mercury that it was very destructive, and a *great devitalizer*, and that it had killed more people than it had ever cured, but all readers of THE JOURNAL will tell you, it is a very good remedy for syphilis, and they would not like to be without it in the treatment of that disease. In conclusion I will say that alcohol is a safe anæsthetic in any disease where an anæsthetic is indicated. In typhoid and all low grades of fever, in shock, in nervous prostration, in a variety of well known conditions, its use has been followed by the happiest results, then why should we not give it? It is wonderful how a smart man like Doctor Chenery will be led into the (to me) extreme notions he has of alcohol. By reference to an article in this same number of THE JOURNAL, by Dr. Everts, of Ohio, the first man he describes, on page 837, you will find Dr. Chenery's position on alcohol very well described, and if the doctor will carefully read the same it is possible he will retract some of his wild assertions. I hope no reader of this article will presume that I am in favor of alcohol as anything else than a well known and useful remedy, but I am satisfied that there are no substitutes for it except those which are equally capable of harm, and until the profession show to the contrary I, for one, will continue to prescribe alcohol.

Very respectfully,

W. P. HOWLE, M.D.

Oran, Scott County, Mo.

Insanity.

To the Editor:—Dr. Everts' paper entitled "Insanity as Related to Civilization," printed in THE JOURNAL for November 28 ult., cannot fail to excite well merited attention. His thesis is not to show the causes of insanity, but to indicate how the conditions of civilization favor the preservation and transmission of certain constitutional or organic states that may, under appropriate circumstances, manifest the symptom—insanity. How these constitutional or organic states arise, he does not attempt to explain.

It is made clear that civilization is responsible for as much of the insanity—or of the conditions which make it possible—as its fostering care can preserve; but this is not the only relation which exists between civilization and insanity. Civilization should be held more primarily and actively responsible for that potentiality (more properly *impotentiality*), which finds expression in insanity. Change of environment is the *cause* of organic variations; it is the unceasing interaction that exists between living organisms and environment that gives rise to progress, and to relative or absolute retrogression, when the organism fails to respond actively to the stimulus of environment.

Degeneracy—failure to respond adaptively to the stimulus of environment—is a biological accident. The organism manifesting it may be maintained for a time, and

transmit its *impotentiality* to succeeding organisms, but here retrogressive annihilation is inevitable. Nature has been and ever will be superior to art; she cannot be frustrated. The conditions always obtain for the production of degeneracy. If civilization had never favored the degenerate, still they would be with us. The rôle Dr. Everts gives civilization in explaining its effect on degenerates, its effort to keep life's stage as full of laggards as possible, is therefore but one of its parts.

It is most encouraging to see that degeneracy is at last winning due recognition as an element in the production of insanity; but it may be doubted whether the most ardent advocates of its influence in the production of morbid mental symptomatology will go so far as to think that insanity *per se* is a sign of anthropological degeneration. Inasmuch as *insanity* is but a general symptomatological designation which covers manifestations due to various morbid cerebral processes, it may still be maintained that all of us are obnoxious to "insanity" in one form or another.

CHARLES G. CHADDOCK, M.D.,

Asst. Sup't. Northern Asylum.

Traverse City, Mich., December 12, 1891.

To the Editor of the Journal of the American Medical Association:

Dear Sir:—In reading the report of the transactions of the American Electro-therapeutic Association, I find some errors which are calculated to mislead your readers. I therefore ask the privilege of correcting some which pertain to my remarks as reported in last week's issue, Dec. 5.

The stenographic report has no doubt been followed strictly, but the speakers have not been allowed to revise or correct the report of their remarks, which is to be deplored.

In the abstract of my paper, in describing the different coils, an error has occurred in dividing up the coil of No. 32 wire. It should read: Then another coil of No. 32 wire 800 yards long, tapped at 500 yards would give a coil of 800 yards, one of 500 yards and one of 300 yards.

In the second paragraph from the bottom of the first column, on page 887, it should read: When the coarse wire secondary coil only partially covers the primary there is less electro motive force to the current it furnishes than where it completely covers the primary, and when a high resistance is encountered, it is, of course, inappreciable as compared with the current from the fine wire secondary, which, when only partially exposed to the influence of the core, has a greater electro-motive force. But when the resistance is low the increased volume of the current from the coarse wire coil is more pronounced, because less electro-motive force is required for penetrating.

In the next paragraph the first sentence should end thus: *as the current has a greater electro motive force*, instead of, as you have more current.

The third paragraph on the last column of page 887 should read: Dr. Englemann, of St. Louis, has made some observations upon the action of this current which are

foreign to my experience. He claims that in recent injuries and venous engorgements a better effect is obtained from the current from the coarse wire coil than from that from the fine wire coil; that in these conditions the current from the fine wire coil will produce irritation. This may explain the apparently unfavorable effect of the current in the case related by Dr. Hayd. He, Dr. Hayd, did not know what injury had been produced by examinations or otherwise before the application of the current.

Other errors are noticeable which are not important, but show that the stenographer did not transcribe his notes easily, and the construction is clumsy.

Respectfully,

AUGUSTIN H. GOELET, M.D.

N. Y., Dec. 7, 1891.

MISCELLANY.

ASSOCIATION OF MILITARY SURGEONS OF THE NATIONAL GUARD OF THE UNITED STATES.—The second annual session of the Association of Military Surgeons of the National Guard of the United States will be held at St. Louis, April 19th, 20th and 21st, 1892. An interesting programme of addresses by prominent surgeons of the National Guard and the United States Army has been arranged, and a goodly number of scientific papers on military and accidental surgery will be read and discussed, and all matters pertaining to the health, usefulness and welfare of the civilian soldiers will receive attention.

The afternoon of one day will be set apart for an object lesson from the "Manual of Drill" by Hospital Corps of the United States Army, detailed for this purpose. This will be a very important as well as instructive feature of this session. The evenings will be given up to entertainments, receptions and banquets, which the medical profession and generous citizens of St. Louis have planned for their distinguished guests. The Committee of Arrangements have received the assurance that transportation will be satisfactorily reduced on all railroads and steamboats, to and from this meeting. The several hotels have promised a low and uniform rate, which will be announced at an early date. It is anticipated that not less than 500 surgeons and assistant surgeons of the National Guard of the United States will be in attendance, to all of whom the Committee of Arrangements extend a most cordial welcome.

EUST. CHANCELLOR,
Chairman Committee of Arrangements.

THE LOOFAH AS AN ASEPTIC SCRUBBING BRUSH.—The desire of surgeons to obtain a clean brush for scrubbing the skin before operations, in order to remove accumulations of epithelium and bacteria, makes a cheap article a desideratum.

I think that small pieces of the Egyptian loofah, which is found in all drug stores for use in the bath-room, meet the indications admirably. For a number of years I have used pieces of this material for cleansing the skin before operations. A single loofah costs about 10 cents, and is large enough to be cut into ten or a dozen pieces. After use these pieces may be thrown away, as the cost is rather less than a cent each.

This vegetable scrubbing brush, as it may be called, is of course of no value in cleansing a surgeon's nails, because it will not enter the subungual spaces as will the bristles of a brush.

I usually carry in my operating-case three or four pieces of loofah for scrubbing patients. It comes compressed like sponges, and a piece cut off before the loofah has been soaked in fluid can be carried in a small compass in an operating-case. For hospital use, pieces of loofah can be kept soaking in sublimate solution until used, and then thrown away, or soaked again, as the more expensive nail brushes are treated.—JOHN B. ROBERTS, M.D., in *Medical News*.

A VENEREAL CONGRESS.—A project is now under discussion by different boards of the Paris municipal government to establish an International Congress to consider questions connected with prostitution and the limitation of venereal diseases. It is proposed to hold the Congress in Paris, in 1893, and to invite medical men, lawyers, sanitary officials and political economists.—*Boston Med. and Surg. Journal*.

IN France the law provides that the person who summons a doctor thereby makes himself liable for the fee.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from November 28, 1891, to December 4, 1891.

Capt. Robert R. Ball, Asst. Surgeon U. S. A., leave of absence granted is extended one month.
Capt. Louis M. Maus, Asst. Surgeon U. S. A., is granted leave of absence for one month.
First Lieut. Paul Shillock, Asst. Surgeon U. S. A., is relieved from duty at Ft. Yates, N. D., and ordered to Ft. Grant, Ariz., for duty.
Capt. Arthur W. Taylor, Asst. Surgeon U. S. A., having been found incapacitated for active service by an Army Retiring Board, will proceed to his home.
First Lieut. William N. Suter, Asst. Surgeon U. S. A., is relieved from further duty at Ft. Grant, Ariz., and assigned to duty at Ft. Bowie, Ariz.
Capt. William O. Stephenson, Asst. Surgeon U. S. A., is relieved from duty at Columbus Bks., O., and will report in person to the commanding officer, Ft. Niagara, N. Y., for duty at that post.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending December 5, 1891.

Surgeon T. C. Heyl, placed on the Retired List December 3, 1891.
Surgeon W. H. Jones, promoted to Medical Inspector November 14, 1891.
P. A. Surgeon Frank Anderson, promoted to Surgeon November 14, 1891.
Asst. Surgeon N. J. Blackwood, from Navy Yard, League Island, Pa., and to the U. S. S. "Miantonomah."
Asst. Surgeon Lewis Morris, ordered to the Navy Yard, League Island, Pa.

Official List of Changes of Stations and Duties of Medical Officers of the U. S. Marine-Hospital Service, for the Three Weeks Ending November 28, 1891.

Surgeon John Vansant, leave of absence extended ten days. November 27, 1891.
Surgeon J. B. Hamilton, detailed for special duty. November 25, 1891.
Surgeon Fairfax Irwin, to proceed to Cape Charles Quarantine for duty. November 25, 1891.
P. A. Surgeon H. R. Carter, to proceed to Savannah, Ga., for temporary duty. November 19, 1891.
P. A. Surgeon C. E. Banks, to proceed to Boston, Mass., for special duty. November 9, 1891. To proceed to Washington, D. C., on special duty. November 24, 1891.
P. A. Surgeon P. C. Kallach, relieved from duty at San Francisco, Cal.; ordered to Boston, Mass. November 20, 1891.
P. A. Surgeon J. H. White, to proceed to Harris Neck, Ga., for special duty. November 17, 1891.
P. A. Surgeon P. M. Carrington, to proceed to Harris Neck, Ga., for special duty. November 19, 1891.
P. A. Surgeon L. L. Williams, granted leave of absence for twenty-nine days. November 14, 1891.
P. A. Surgeon W. J. Pettus, relieved from duty at Cape Charles Quarantine; ordered to Buffalo, N. Y., for temporary duty. November 25, 1891.
P. A. Surgeon T. B. Perry, to rejoin station at Baltimore, Md. November 19, 1891.
Asst. Surgeon J. O. Cobb, granted leave of absence for twenty days. November 13, 1891.
Asst. Surgeon G. B. Young, to proceed to Memphis, Tenn., for temporary duty. November 13, 1891.

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No. 25.

ORIGINAL ARTICLES.

VERTEBRAL SURGERY WITH REPORT OF THREE CASES, AND A NEW METHOD OF OPERATING IN THE DORSAL REGION.

Read before the Illinois State Medical Society, 1891.

BY F. C. SCHAEFER, M.D.,

SURGEON TO WESLEY HOSPITAL, PROFESSOR OF ANATOMY
CHICAGO MEDICAL COLLEGE.

Operations upon the spine are called for in cases of: 1. Traumatism; 2, Neoplasms; 3, Caries. It is my desire to occupy a few moments of your time by briefly reporting three cases of the third class, and giving the result of operations upon the cadaver, done with a view of ascertaining how to attack the diseased bodies of the vertebræ with the least degree of danger to, or disturbance of, the spinal cord in the dorsal region. Among the most troublesome cases the surgeon has to contend with, we may safely place caries of the vertebræ, and especially the tubercular variety. During the past two years it has fallen to my lot to treat a number of these, three of which I will report at the present time as germane to the topic, viz.: "Operations upon the spine for caries of the bodies of the vertebræ."

History. Case 1.—Miss C. J., aged 29 years. Admitted into Wesley Hospital, Nov. 13, 1889; well nourished. Three years ago was treated for rheumatic fever. Has had pain in her back over lower dorsal region from that time to the present. Has always had a weak back. Two months ago the pain began to grow worse. Three weeks later she noticed a slight swelling behind the pelvis under the crest of the ilium.

Examination.—There is a large swelling on the gluteal (right) region, hemispherical in form, about $5\frac{1}{2}$ inches in diameter at its base. There is also another swelling of considerable size in the right iliac region. Upon palpation fluctuation is elicited in both tumors and a communicating wave can be distinctly felt projected from one tumor into the other over the crest of the ilium. She cannot sit erect. When she makes the effort it gives her great pain in the back. Pressure upon the spinous processes of the tenth

and eleventh vertebræ (dorsal) makes her complain of great suffering in the corresponding portion of the spine. Feels most comfortable with her body bent forward and thighs placed upon the trunk. She occasionally has pain in the course of distribution of the branches of the anterior crural nerve. Can not walk without support, and then with great effort of will. Temperature 100° F., pulse, 84.

Diagnosis.—Caries of the body of the 10th or 11th dorsal vertebra, or both, with psoas abscess.

Treatment.—With antiseptic precautions I aspirated the gluteal abscess, in the presence of Drs. McNamara and Lorman, withdrawing fully a quart of tubercular fluid and immediately injected a preparation of iodoform with glycerine and alcohol, and closed the wound with sublimated gauze, sealed with collodion. For about one week she was much relieved of pain, but the abscess cavity gradually filled up and her temperature varied from 99° to $102\frac{1}{2}^{\circ}$ F., until December 27, when she seemed to be in a worse condition than when she entered the hospital. I now decided to drain the cavities, and if possible, attack the seat of disease. Made one incision above the crest of the ilium, over the interval between the latissimus dorsi and the external oblique muscles, the point through which the two abscess tumors communicated. There was a discharge of about a quart of tubercular fluid. Carried finger down into the pelvic abscess cavity; found it extended to the crural arch. Curetted and washed it out with bichloride solution; treated gluteal abscess in the same manner and inserted drains. Next carried a curved uterine dressing forceps through the sinus behind psoas muscle to upper border of the first lumbar vertebra, cut down through the muscles at this point and carried a tube through from crest of ilium to the last rib; next enlarged opening under the last rib, and carried probe up in front of the transverse processes to the body of the tenth dorsal vertebra, and here struck dead bone, which I partially curetted with a small bent instrument, similar to Simms' uterine curette. It was, however, impossible to curette thoroughly, owing to the interference of the transverse processes. I succeeded in carrying a drainage tube into the body of the bone between the transverse process-

es of tenth and eleventh vertebræ, through which the pus discharged freely. In 24 hours temperature was 104° ; in 36 hours, $98\frac{1}{2}^{\circ}$. From December 27 to March 4, temperature fluctuated between $98\frac{1}{2}^{\circ}$ and 100° , averaging about $99\frac{1}{2}^{\circ}$. April 5 placed her in a Sayre jacket, which she wore four weeks, and during this time she walked about the hospital with ease. Temperature averaged 99° . June 8 renewed Sayre jacket. June 17 manifested lung symptoms, advised her to go into the country, hoping a change of air would do her good. Temperature 100° . The sinuses were all healed in two months after the operation, excepting the one going directly into the body of the tenth vertebra, which still discharged a little pus at times. Six months after her departure from the hospital she died of tuberculosis of the lungs. This patient was very comfortable for four months, from January 10 to June 1; almost entirely free from pain, and had perfect use of her limbs.

History. Case 2.—Miss H. W., aged 21 years. Entered Wesley Hospital March 26, 1890; considerably emaciated. Mother and father in good health. Sister died of consumption at the age of 22 years. About one year ago our patient began to feel pain in the back of her neck upon rising from bed, which became more and more severe, and in about two months' time extended to the left arm, which was soon paralyzed. She lost entire use of the arm. After another two months the arm began to improve, but her neck grew worse, and for one month she lost her voice, which, however, came back suddenly. Then her face began to swell and teeth decayed rapidly. Soon after restoration of voice she noticed a swelling in the left sub-occipital triangle, which constantly increased in size until it had filled the entire posterior triangle. All this time patient suffered excruciating pain, day and night, at the back of head and neck; also over left shoulder, left arm and ulnar side of corresponding hand. She also experienced difficulty in swallowing. I found a large, hard tumor situated at about the middle portion of the left side of the neck pressing the sterno-mastoid muscle outwards and forwards. The common, internal and external carotid arteries appeared to be pressed forwards in front of the tumor. The neck was slightly flexed to opposite side. With index finger inserted through the mouth, a convex projecting tumor could be felt encroaching upon the lumen of the left half of the pharynx. Retaining finger in pharynx and placing the other hand over the outside of the tumor in the neck I could feel that the pharyngeal growth corresponded to the cervical. No fluctuation. The tumor seemed as dense as bone, and as large as a medium sized orange. It was variously diagnosticated by different physicians. One called it a cancer; another fibroma. I concluded

that it was either an osteo-sarcoma or abscess from caries of a cervical vertebræ. The extreme hardness being the only doubtful feature with reference to the latter. March 31 I concluded to operate, with the assistance of Drs. Danforth and Greene. Made a large incision behind the sterno-mastoid muscle, avoiding the branches of the cervical plexus, which were carefully drawn aside as the dissection progressed. Immediately after cutting through the deep layer of the cervical fascia fluctuation was apparent. I opened the wall of the abscess. There was a tremendous gush of blood, which was soon followed by cheesy matter. The blood, however, continued to well up at a great rate. I quickly dipped my finger into the cavity and found very large excavation in the body of the 4th cervical vertebra, in fact, there seemed very little left of the bone. Cured the walls of the cavity and stopped hæmorrhage by packing the hole with strips of iodoform gauze, and placed patient on her back without pillow for head. On the third day took out packing and inserted drainage tube. She could not hold her head up, as the supports were gone. Her neck felt as if it was broken. Kept her bed about two weeks. The wound discharged a little four weeks. After the second week adjusted a jury mast to her head and back, which permitted her to walk about. All pains were gone excepting a local tenderness of the spine. Twenty-four hours after operation temperature ran up to 101° . It was normal four-fifths of the time from day of operation until her discharge, May 15, 1890. Three months ago her mother wrote me that her daughter had laid aside her jury mast, could hold her head erect, and was engaged about the house doing house-work; was feeling well.

Case 3.—Mr. H., aged 35 years; horse-shoer. Admitted in Wesley Hospital January 28, 1891; American. Patient had inflammatory rheumatism when a child. Some years ago had typhoid fever. Has been quite well for many years preceding the present illness. One year ago last October he was bruised in the back by a refractory horse, has had slight backache ever since, in the sacral region. Last March he began having pain in the left hip and was treated for three or four months for sciatic rheumatism. In September a swelling on the hip was noticed and his doctor cut down upon it, finding tubercular fluid. There have been several attempts to find the origin of the discharge, none of which have been successful.

Examination.—Patient is quite emaciated, but says he has a good appetite. There are several large scars on his hip from previous incisions. There is also a triangular opening on the gluteal region, high up over the back of the ilium, which communicates by a sinus six inches long with one over the trochanter major. There is a free dis-

charge of pus from both of these wounds. Lungs in good condition. Bowels loose. He is too weak to sit up. Pulse 113. Temperature $101\frac{1}{2}^{\circ}$. Exploration of wounds reveals necrosis of trochanter major on its posterior border; quite an excavation exists here. Several sinuses are present, one extends directly through the thigh to its inner border behind adductor muscles, a second sinus leads up to the back of the ilium, and a third one communicates with the pelvic cavity. I passed a flexible uterine sound into the latter opening behind the tuberosity of the ilium, back of the rectum to the anterior surface of the sacrum, a distance of nine inches. The probe struck denuded bone on the anterior surface of the body of second sacral vertebra towards left side. The patient complained of great pain over the sacrum. His legs were strongly flexed. The psoas muscle of the diseased side was contracted.

Diagnosis.—Caries of the sacral body with secondary infection of trochanter. February 9, with assistance of Drs. Danforth, Sage and Miller I concluded to scrape the dead bone and drain the parts diseased. First cut down on trochanter and chiseled away the diseased tissue. Next made a vertical incision one and a half inches to the left of the spinous processes of the last lumbar vertebra, extended this incision into the back of the sacrum. This cut led me into the triangular space below the transverse process of the last lumbar vertebra, bounded below by the body of the sacrum, at its outer side by lumbosacral ligament, limited internally by the body of the last lumbar vertebra. Through this opening (two inches deep) I passed my finger and hooked it over the anterior surface of the sacrum into the pelvic cavity. With a bent probe reached the diseased bone, then introduced a bent curette with flexible handle and curetted as well as possible the sacral segment, which was necrosed, also lightly scraped the long sinus from below, and finding it impossible to carry a tube from the lower opening at the trochanter through pelvic cavity to the upper opening at the top of the pelvis, distance of ten inches, I concluded to make a sally by way of the great sciatic notch, half way between the two openings. I therefore cut through the gluteus maximus muscle to the upper border of the notch, and thrust a uterine sound, bent into a half circle, through this opening over the front of the sacrum and the promontory into the upper opening. As this opening was two inches deep, it was not possible to bring the sound to the surface, but, with the assistance of Dr. Danforth, a silk thread was fastened below the bulb of the sound and carried through the pelvis; a drainage tube was now attached to the lower end of the thread and drawn through, giving an excellent drain to the diseased bone. Another drainage tube was carried through the

thigh transversely behind trochanter and adductor muscles, and a third drain inserted for the trochanteric cavity. Twenty-four hours after operation his temperature was 99° . It fluctuated between normal and 102° , averaging about $99\frac{1}{2}^{\circ}$, until the day of his discharge, March 4, when it was normal. About ten days ago I received information that he was able to sit up, and the wounds were almost healed. There was still a little discharge from the trochanteric wound. In this case we examined the discharge at the hospital and found bacilli. The operation was undertaken with the hope of relieving, to some extent, the sufferings of our bed-ridden patient, and he certainly has been more comfortable since the operation, although ultimately I fear he will die of tuberculosis of the lungs.

The wounds in all cases were washed daily with bichloride, 1-5000, and sterilized water.

Spinal surgery has assumed an extraordinary degree of importance since the year 1887, following the report of Horsley's first operation for neoplasm, and since then a number of operations have been done for caries and traumatism. I hold that the necrosed bone of the spinal column should be treated upon the same principles as similar disease in other bones. In other words, when we are certain that suppuration exists, we ought to endeavor, if possible (providing that systemic conditions or other complications do not contra-indicate), to reach the seat of disease, remove all that we can of the dead tissue, and establish thorough drainage, for we know that a long continued suppuration with accompanying infiltrations of pathogenic fluid must soon undermine the vitality of our patient, and the paralysis accompanying many cases must be attributed to the inflammatory and suppurative processes, causing pressure upon the cord, rather than to the disease of the cord itself. (See paper of Dr. Geo. E. Elliot, *N. Y. Medical Journal*, June 2, 1888.) Grave as this operation ever must be, the experience of Drs. Morenan, Horsley, Albee, Lane, Duncan and White (*Annals of Surgery*, July, 1889), it seems to me, fully justify the procedure. These operators had ten cases of laminectomy (for caries) of the gravest kind. They report three recovered, four improved. One of complete paralysis of all four limbs recovered. One with incontinence of urine and fæces, with complete sensory and motor paralysis, was also cured; a third one with paralysis of lower extremities recovered perfect motion of both legs. In two of these we are told that the laminae and spinous processes of the three successive vertebrae were excised—a most formidable operation. In view of these facts it appears to me that the old method of opening a psoas abscess a foot or more from the point of disease without attacking its *fons at origo* is unphilosophical, irrational and decidedly unsurgical. In cutting down up-

on the diseased body of a vertebra it would seem extremely desirable to avoid opening the spinal canal, to prevent injury to the cord, to avoid hæmorrhage into the canal, or even infiltration of septic matter, and this should be done before paralysis occurs, if possible, or at least as soon as an abscess appears with pressure symptoms. Such operative procedure is, however, not simple, as any surgeon who has made the attempt will attest, especially in the dorsal region. Laminectomy at this time of course defeats the object sought. With a view of ascertaining how to accomplish this most effectively and directly, I instituted a series of experiments upon the cadaver. In the cervical region it can usually be accomplished most readily by following up the sinus of the abscess cavity, or as has been done in the upper region of the pharynx, *via* mouth. In the lumbar region an incision over transverse processes through the superficial tissues and along the border of the multifidus spinæ muscles, $1\frac{1}{4}$ inches from the spinous processes, enables one to get behind the psoas muscle (as in case 1, reported), to the vertebral body. The sacral body can be reached as in case 3, *via* the triangle between the transverse process of the fifth lumbar vertebra and the base of the sacrum, also through the great sciatic notch; through or back of the rectum, or by trephining through the bone from behind. In the dorsal region between the transverse processes, but the space here is so narrow as to preclude the possibility of thorough treatment; I therefore incised the soft tissues, one inch from the spinous processes, uncovered and removed the transverse process of the diseased bone, or of the one just below it, and resected the head and neck of the corresponding rib. This permits a large finger to reach the postero-lateral angle of the diseased body, and gives room for the introduction of the curette, sharp spoon or forceps, and leaves a large space for drainage tube. Should it be desirable to carry the drainage tube through the column, a transverse process with end of the rib of the opposite side can also be removed, when it can readily be passed through. In doing this operation we must avoid the pleura, dorsal ganglia of the sympathetic, spinal nerves, and intercostal arteries. One can hardly avoid injuring the artery. The other tissues need not be damaged. Hæmorrhage can be controlled. The difficult part of the operation is in disarticulating the head of the rib, as it is deeply placed and firmly attached. To avoid injuring the pleura and the ganglia of the sympathetic, it is a good plan after sawing through (chiseling or cutting with bone forceps), the rib at its tuberosity, to strip off the periosteum in front of the neck and head of the rib. The transverse process I remove with chisel. The disarticulation of the rib can be done with scissors or knife, by

following the attachments of the ligaments about the neck and head of the rib. The operation is practicable, less formidable than laminectomy; the latter operation involves more cutting. The spinal supports are not so much weakened, and the spinal canal not opened, unless the back portion of the vertebral body is destroyed. Even then the posterior common ligament may protect the canal. Of course it is to be understood that the operation is not intended to take the place of laminectomy in cases of great angular curvature, but to be resorted to before the disease has produced any great deformity, as soon as an abscess has been discovered.

COMPLICATIONS DURING AND FOLLOWING ABDOMINAL OPERATIONS.

BY RUFUS B. HALL, M.D.,
OF CINCINNATI, O.

Abdominal and pelvic surgery to-day is practiced by as restless and ambitious a throng as ever fought for fame upon the battlefield. There is probably not a State in the Union which cannot produce at least one man from each county, who has made one or more abdominal sections in the past few years. In many instances the welfare of the patient is only a secondary consideration to them. The prevalence of the mistaken idea that intra-abdominal and pelvic surgery is an exceedingly easy procedure, and the desire for local fame is what induces the large per cent. of these men to undertake the work. But after they have had a few deaths on account of unlooked-for complications, they have learned that opening the abdomen and making the necessary operations is not always easy, as has been so frequently stated by abdominal surgeons. Not a few of these men, to my knowledge, have very wisely said, no more abdominal surgery for them. It is easy in many cases, after special training in all of the technique of abdominal and pelvic surgery, but most difficult without this.

These are trying times for men engaged in this special work. They have their position to sustain and their advancement to make against the many difficulties incident to the work, as well as against the failures of those who insist upon opening the abdomen because it is easy. We all know an uncomplicated ovariectomy is one of the easiest of the capital operations; yet we must admit that it is a serious one, to be carefully performed after careful consideration. We are to remember, that very frequently that which appeared to be a simple and easy operation, may, and not infrequently does, terminate in the most complicated condition, and the complications must be carefully overcome if we hope or expect to save the life of the patient. The removal of the tumor in many instances is the least part of the operation; and in these complications arising after the

operation, is where the man who has had ample training will save the life of the patient, while one who sees the complications for the first time, will probably have a death follow. The careful attention to every minute detail which alone can bring success to the operation, is only attained by long and careful training; that training which is obtained by an apprenticeship for many months with different operators; without which no man should undertake abdominal and pelvic surgery with the mistaken idea that it is an easy operation, and one devoid of serious risk. So long as the craze "to open the abdomen because it is easy" exists, the end must be disappointment to the operator and complaint by the profession. The sooner the men engaged in this special work come to the front with a report of their complicated cases, illustrating complications during the operation, and those immediately following it, and show that no man can be at all certain as to the gravity and extent of the complications to be met with in any given case, or what complications may follow the operation, the better for humanity and the profession at large. No man has a moral or legal right to open a patient's abdomen unless he is prepared for any emergency which might occur, and is himself competent to deal with the conditions found, on the spur of the moment and in a surgical manner; unless the exigencies of the case are such that the patient would be in greater danger from a few hours' delay than is ordinarily encountered from the inexperienced operator. A knowledge of the accidents that may happen is one of the best means of avoiding them, and this knowledge can only be attained by an apprenticeship extending over a long period of time, or at a great sacrifice to human life, if the work is prosecuted without preliminary training. It is now conceded by all that the success following pelvic and abdominal operations are measured by the ability of the operator to overcome the many complications met with in each individual case. It is also conceded that in the most carefully performed operations by the most experienced operator, there not infrequently arises at the time of the operation, or within a few hours or days, complications of the most grave character, which menace the life of the patient and not infrequently cause their death. When these complications come to the inexperienced, the patient is usually lost. The accidents and complications must, of course, vary according to the organ dealt with, or the nature of the operation. Frequently the abdominal cavity is opened with a view of making a diagnosis, and doing upon the spur of the moment that which is there revealed. We may have some idea of what we may encounter, yet we are frequently treated to extraordinary surprises; as illustrated in a case which I operated upon in September, 1889, in which an exploration was

made to clear up the diagnosis in an obscure kidney case in which the symptoms of stone were not well defined, and upon exploration there was found an irregular shaped stone impacted in the ureter some three inches below the kidney, which was removed by a second incision in the loin, after overcoming many unlooked-for difficulties; yet the patient recovered. Some of the gravest complications during the operation are caused by separating adhesions. In any of these cases we may have hæmorrhage or intestinal rupture, or both. They are the most frequent in long-standing pelvic inflammations of gonorrhœal origin. In some of these cases the tissues are so friable that it is impossible to apply a ligature in the ordinary way, and the vessels must be ligated separately; or what is still more difficult, and which must be done in some cases, is to cobble stitch the broad ligament, a procedure that I have been compelled to do in three different cases before the hæmorrhage could be controlled, without which the patient would have died on the table. In two of these cases the tube and ovary came away when an attempt was made to bring the specimen up to the incision preparatory to passing the ligature; in the other case, when the ligature was tightened, it cut its way through the tissue; in all of these cases the hæmorrhage was frightful. In each of them the incision was at once enlarged, the patient's hips elevated, hæmorrhage temporarily controlled by pressure of forceps, after which the entire broad ligament was stitched through, controlling the hæmorrhage, and the patients recovered. In many of these cases the intestine is denuded of peritoneum at the point where the adhesions were separated. If we carefully place a few stitches and strengthen these weak points—a procedure I invariably adopt in all deep lacerations—we will save not a few lives which would otherwise be lost. In some of these cases we will have intestinal rupture after the most carefully performed operations, which must be repaired at once. This accident I have had twice in the past year; one, with a rent an inch long, recovered without fæcal or other fistula; the other had a fæcal fistula for fourteen days, but the patient recovered. In the first case the bowel could be brought into the wound and repaired, which was done. In the second this could not be accomplished; therefore the edges of the rent could not be so accurately coapted deep down in the pelvis, and the result was not so satisfactory. Complications arising after operations must be dealt with in the same concise, determined manner as those encountered during the operation, if we expect to save our patient. The following case illustrates what can be done in the presence of grave complications by prompt interference: The patient was operated upon in December last for gonorrhœal pus tubes. Everything went well until the morning

of the fourth day. The drainage tube was out, bowels had been thoroughly moved, and I began to congratulate myself upon having an easy convalescence after such a dirty pus operation. The morning of the fourth day, however, the patient complained of pain in the left half of the pelvis. The pain grew gradually worse during the day; she developed some fever in the evening, and spent a restless night. At six A.M. the following morning, temperature 101, pulse 120, with a circumscribed painful point in the region of the left stump, of a throbbing, burning character. She grew rapidly worse until the evening of the sixth day after the operation, at which time she had a pulse 150, temperature 104.5. All day the patient had been restless, and at times quite delirious. Everything in the shape of drugs which promised anything had been tried without avail. She had no chill or sweats, yet I felt certain that she had an accumulation of pus in the left side of the pelvis, and decided to reopen and drain the abdomen. Without the use of an anæsthetic, I removed a few stitches at the lower end of the incision, tore the wound open, and introduced the finger into the cavity, and broke up adhesions until I found the left pedicle; upon withdrawing the finger, an ounce or two of pus was discharged. I introduced a piece of gauze, and applied a gauze and cotton dressing. The patient slept well during the night; was awake but twice for a short time. She made a rapid recovery. The temperature was never up to 101 after that time. She went home on the twenty-sixth day. I am certain this patient would have died in a few hours if the pus had not been evacuated. It is such a serious thing to reopen the abdomen after operations that no one feels like doing so as long as the patient has any chance of recovery without it. For this reason we may delay, between hope on one hand and dread on the other, until the patient has practically no chance at all on account of the delay before we fully make up our minds to reopen. The danger of delay, where it is necessary to reopen, is very forcibly illustrated by the result in the following case, operated upon in June, 1890, for sarcoma of the ovary, weighing four pounds. The pedicle was a thick, short one, and was ligated with difficulty. Patient did well until the third day, when, after giving a physic, she developed symptoms of intestinal obstruction, which grew worse every hour. It was thirty-six hours later before I gave up hope of overcoming the obstruction with salines and enemas. But by that time the patient was very much exhausted, yet, after a consultation with my friends, Drs. Reed and Ricketts, it was agreed that the only chance for recovery was to reopen the abdomen and relieve the obstruction. She was put upon the table under ether, a few stitches removed, and two fingers introduced into the cavity, which were

carried at once to the pedicle, and the obstruction found to be due to a coil of intestine adherent to the stump in such a manner as to cause complete obstruction when it was distended by gas. The intestine was separated without difficulty; the whole operation did not require fifteen minutes' time, and the patient's bowels moved before she could be placed in bed, yet she died three hours afterward from the shock. The case was lost because I did not have the courage of my convictions, to reopen the abdomen as soon as the diagnosis of obstruction was made, which was twenty-four hours before the cavity was opened.

The cases narrated in this paper are by no means all of those in which I have had complications, but selected to illustrate, in a measure, what every man will sooner or later encounter if he makes many abdominal operations. It is not necessary to relate more cases to show that abdominal operations are not always easy, and to illustrate complications which will certainly greatly embarrass the inexperienced operator. And when the complications occur, and they are not prepared to meet the emergency, the patient pays all too dearly for their inexperience by the forfeit of her life.

NEW METHOD OF INFLATING (CATHETERIZING) THE MIDDLE EAR.

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The great importance of diseases of the middle ear, the serious and sometimes fatal consequences attending this class of cases, and the difficulty in applying therapeutic aid to an organ so deeply situated, are facts which are recognized by all enlightened medical men at the present day. In the therapeutics, as well as the diagnosis, of inflammations of the tympanic chamber, inflation occupies a prominent position. By inflation is meant the process by which air is driven through the Eustachian tube into the tympanum. There are various methods of accomplishing this result. Before proceeding further, I would ask your attention to a few historical facts.

HISTORY OF MIDDLE EAR INFLATION.

The Eustachian tube was first accurately described by Bartholomew Eustachius, professor of anatomy at Rome. He died in 1574, leaving posterity a series of splendid copper-plate engravings designed to illustrate the anatomy of the human body. These were his own handiwork, and, as time willed, were lost sight of for nearly a century and a half. When discovered, the Eustachian plates were presented by Pope Clement XI to his physician, Lancisi, who published them at Rome in 1714. In the work of Eusta-

chius the intrinsic muscles of the ear were first described.¹

Ten years before the publication of the book of Eustachius, Valsalva, as the best method for removing pus from the ear, recommended forcing air through the Eustachian tube, with the mouth and nose closed. This method is known as the "Valsalvan experiment."

Catheterism of the tube was first employed by Guyot, a postmaster of Versailles, who claimed to have cured an impairment of his own hearing by this means. Guyot introduced an instrument through the mouth, and probably reached the

name. Other methods have been described by Lucaë and Gruber.

MODUS OPERANDI OF THE NEW METHOD.

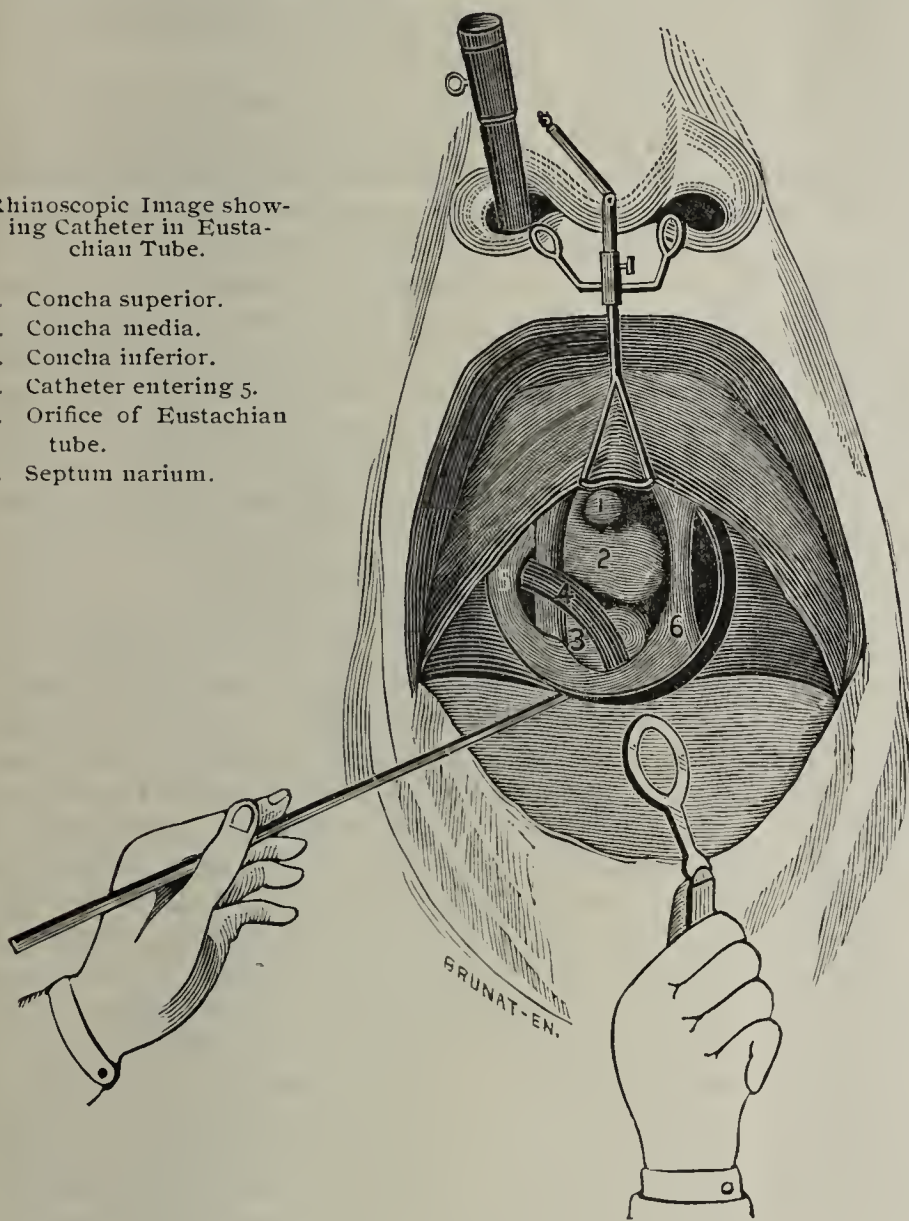
It is my purpose, in this brief paper, to call attention to a method of using the Eustachian catheter which has given me most excellent results, and which, so far as my knowledge extends, has previously not been described. In order to avoid any possible controversy regarding priority in the use of the method to be described, I will here state that the idea was an original one to me, and that I have used the procedure almost daily for the past fourteen months. My method is based upon a new application of principles already known, and the use of instruments which already exist. In order to avoid any mistake, it may be well to repeat here, what is already implied by the title of this paper, that the procedure about to be described is an improved method of catheterization of the Eustachian tube. By the methods heretofore employed, the operator trusted entirely to the sense of touch to guide the catheter into position. By the method which I shall describe, *the operator can see, as well as feel, the instrument enter the orifice of the Eustachian tube.*

The method is as follows: The patient's nose is first sprayed with a cleansing solution, to remove all débris. A solution of cocaine is then sprayed over the lower nasal mucous membrane until anæsthesia is produced. The patient is then told to clear his throat of any mucus that may have accumulated. He is then given a rectangular tongue depressor, and told to hold it firmly in place, taking care not to push it backward so far as to cause retching. Artificial light is then to be concentrated upon the patient's mouth by a forehead mirror and White's palate retractor, which is self-retaining, is applied. The soft palate is drawn

forward with considerable firmness, and held in this position by means of a set-screw with which the instrument is provided. A hard-rubber Eustachian catheter is then passed into the nose on the side corresponding to the tube to be inflated, and allowed to remain. The next step is to take a rhinoscopic mirror in the left hand, warm it over the lamp or gas, and pass it into the upper pharynx behind the velum. It is at this point that the value of the palate retractor becomes apparent. It draws the palate forward and gives the operator

Rhinoscopic Image showing Catheter in Eustachian Tube.

1. Concha superior.
2. Concha media.
3. Concha inferior.
4. Catheter entering 5.
5. Orifice of Eustachian tube.
6. Septum narium.



vicinity of the tube.² To him belongs the credit of originating the idea, while the merit of its practical employment belongs to Archibald Cleland, an English surgeon, who, in 1750, injected air and fluids through a silver probe-shaped tube, inserted through the nose.

In recent years Adam Politzer, of Vienna, has described the method of inflation which bears his

¹ Lancisi: Tabulæ Anatomicae Clarissimi viri Bartholomæi Eustachii. Amstelædami, MDCCXXII. Tab. xli, Fig. ix, x.

² Gruber: Diseases of the Ear, N. Y., 1891.

sufficient room in which to manipulate the mirror, which brings into view all the landmarks in this region—the septum, the choanæ, the superior, middle and inferior turbinated bodies, the fossa of Rosenmüller, and *the orifice of the Eustachian tube*. The last named is the objective point.

The mirror still being in the left hand, and the patient holding the tongue-depressor, the operator grasps the catheter between the thumb, index and middle fingers of the right hand, and passes the instrument directly into the orifice of the Eustachian tube. *Every step of the operation is visible in the rhinoscopic mirror.* The mirror is then quickly withdrawn, the hands are changed so that the catheter will be held by the left hand, while the inflation is completed by an ordinary air-bag held in the right palm. Finally, the catheter is withdrawn, the palate-retractor removed, and the operation is over. The whole manipulation can be done in less time than it takes to describe it.

To bring the pharyngeal openings of the Eustachian tubes well into view, it is advisable to use a mirror which is set at an obtuse angle with the stem, and to hold it as much as possible in a position facing the tubes. It is not possible, in all cases, to see all of the landmarks at the same time, consequently the mirror must be turned from side to side until the parts desired can be brought to view. The Eustachian orifice can be recognized as a pit, or depression, located external to the lower turbinated body. In the normal state, the mucous membrane at the entrance to the tube is paler than that in its vicinity, which is of a deep red color. As seen in the rhinoscopic mirror, the relation of the different parts is, of course, altered, those situated behind seeming to be in front, and *vice versa*. Thus the cartilaginous prominence of the posterior wall of the tube seems to be in front, and the anterior membranous wall with the salpingo-palatine fold is seen behind. So, also, the long diameter of the pharyngeal opening of the tube is, in reality, directed downwards and backwards, though in the mirror its direction seems to be downwards and forwards. Rosenmüller's fossa, again, which is behind the protuberant lip of the mouth of the tube, seems to be in front of it, appearing as a curved dark space.

There are very few patients in whom, on account of the excitability of the pharyngeal muscles, it will be impossible to carry out this method of inflation at the first sitting. In such cases it is sometimes necessary to apply a swab, soaked with cocaine, to the faucial pillars. After two or three sittings, the mucous membrane becomes accustomed to the contact of instruments, and the treatment can be carried out. In a few rare cases of pharyngeal spasm it will be necessary to use considerable force in drawing the

palate forward, but after two or three minutes the muscles give up the unequal contest and remain quiescent. The activity of the salivary and buccal glands, in pouring out an abundant thick secretion, may interfere with the view of the parts in the mirror. In such cases, either the operator should cleanse the throat with a swab of cotton held in an ordinary sponge-holder, or the patient should eject the saliva in the ordinary way. Most patients will have no trouble in clearing the throat, even when the palate-retractor is in place.

ADVANTAGES OF THE WRITER'S METHOD OF INFLATION.

What are the advantages of this method of inflating the middle ear?

1. In the first place, the operator is absolutely certain that the instrument has entered the orifice of the Eustachian tube, and for this reason the method I have described is of the greatest value in cases where we wish to apply astringents to the tube, or dilate it by means of bougies.³ There can be no guess-work about the procedure, since its whole field is visible in the rhinoscopic mirror. The difficulties which attend the ordinary methods of catheterization are obviated. There is no more prodding in the dark, and verbose rules for the introduction of the catheter, such as are found in all modern works on otology, are unnecessary. Turnbull says:

"The rules laid down by authors for the manner of introducing the Eustachian catheter are very unsatisfactory. The position of the pharyngeal orifice of the tube differs, as can be demonstrated by a rhinoscopic examination, and therefore no one rule is of universal application."⁴

2. The operator can adapt his instrument to the case in hand. By this I mean that he can change the length of the curve of the catheter to suit each individual case. Of course, I now have in mind the hard-rubber instrument, which can be given any desired form. I consider the metallic Eustachian catheter a barbarous and dangerous weapon. I have often found that a catheter, which could be used successfully to inflate the tubes of one patient, would not answer for the next; and I remember several patients in whom the required curvature was radically different for the two sides of the same individual.

3. In using my method, there is no danger of emphysema. The danger of tearing the mucous membrane in the vicinity of the tube, and forcing air beneath it, is recognized by the standard authors of the day. At least three cases are on record of a fatal result following the use of the catheter. Hartmann, of Berlin, says: "Alarm-

³ "Although the employment of bougies for dilating the tubes, to which the older aurists so frequently resorted, has almost been abandoned, they have recently been very highly recommended again by Urbantschitsch."—Hartmann, *Diseases of the Ear*, 1887.

⁴ Turnbull: *Clinical Manual of Diseases of the Ear*, 1888.

ing and even dangerous accidents may be caused by the catheter injuring the mucous membrane and inflating the subjacent and surrounding tissues with air." It is a well known fact that the roof of the tympanum, while always thin, is often incomplete. Hyrtl has described this condition *in extenso*, and has called attention to the contiguity of the dura mater and the mucous lining of the tympanum at such points. Gruber, as long ago as 1864, stated that forced inflation of the middle ear, in the condition just named, may actually induce sub-meningeal emphysema. In the hands of a skilful operator, the method of inflation which I have described cannot be followed by any such disastrous consequences.

WHAT CAN BE DONE IN CEREBRAL SURGERY? REMARKS BASED CHIEFLY UPON PERSONAL EXPERIENCE IN TWENTY-THREE CASES.

Read before the Kansas City Academy of Medicine, November 28, 1891.

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To those unfamiliar with recent advances in surgery of the brain, my paper may be something of a surprise because of the radical changes which have occurred in this department of operative surgery within the past few years; in fact, I doubt not there are some who will contend that we are too aggressive—that we invade the cranium with too much impunity. But from a careful study of twenty-three cases upon which I have operated (a series of cases presenting two deaths and twenty-one recoveries), and a review of recent contributions to the literature of the subject, I firmly believe that we have not yet awakened to the possibilities in operative surgery of the nervous system. Bremer, of St. Louis, says: "Owing to the comparative safety afforded by asepsis, many more skulls are opened than the state of our knowledge of the brain, its physiology and pathology, warrant." Perhaps in its broadest sense this is correct, but the opposite position is equally tenable; in proportion to our knowledge of localizing symptoms, *not enough* skulls are opened—in appropriate diseases.

For what can we operate?

1. Meningeal hæmorrhage.
2. Cerebral hæmorrhage.
3. Tumors of bones, meninges or brain.
4. Cerebral abscess or thrombosis of lateral sinus.
5. Cephalalgia.
6. Epilepsy.
7. Insanity.
8. Tuberculosis.

9. Microcephalus.

Operation for gunshot wounds, fractures, etc., is foreign to this paper, it belonging to accidental surgery.

MENINGEAL HÆMORRHAGE.

Of the practicability and necessity of operation for meningeal hæmorrhage there can be no question; since Macewen, in 1879, opened²⁹ the skull of a boy and removed 2 ozs. of fluid and coagulated blood from beneath the dura in the lower part of the Rolandic fissure, with recovery, cases have been too numerous, and results too satisfactory to admit of discussion. By the term meningeal hæmorrhage I include hæmorrhage between the bone and dura mater, and bleeding into the subdural or subarachnoidal space. Usually this condition is the result of injury, so there is no doubt as to the diagnosis in most cases—the injury being most frequently a rupture of the middle meningeal artery or its anterior branch. The symptoms may occur rapidly, but more often they appear gradually, the bleeding taking place slowly, and continuing until either tension or coagulation closes the vessels, or fatal compression is induced. In a typical case the patient is stunned for some time, but gradually regains consciousness. After an interval of from a half hour to a day or two, symptoms of compression make their appearance. In such cases trephining is always indicated. If one meets a case of non-traumatic origin, the diagnosis rests between meningeal hæmorrhage and embolic or thrombotic softening—a distinction not always possible to make. In such an instance, the patient should be given the benefit of the doubt.

When the intracranial hæmorrhage is due to injury, the external wound indicates the site for operative procedures. If there be no external guide, dependence must be had upon localizing signs, the broad rule being always borne in mind that for hæmorrhage from the anterior branch of the middle meningeal artery, the point of selection (unless very strongly contraindicated), is $1\frac{1}{4}$ inches behind the external angular process; while for the posterior branch, the point is a little below the parietal eminence. As soon as a diagnosis of meningeal hæmorrhage is established, the surgeon should open the cranium under strictest asepticism, remove the clot, thoroughly irrigate with water of a temperature of 110° F., put in a catgut drain, sew the dura with finest catgut sutures, and close the external wound with proper drainage, dressing as any other wound. The drainage tube may be removed on the second or third day. Small strips of iodoform gauze may be employed for drainage if so desired; they have given satisfaction in several of my cases.

The last operation for meningeal hæmorrhage in this city was by Dr. J. W. Perkins.² A boy

received a blow over the anterior branch of the middle meningeal artery. Evidences of compression, including hemiplegia, came on in due time. Four hours later Dr. Perkins trephined, and found a clot considerably larger than an English walnut; this was removed, the bleeding vessel attended to, the wound irrigated and closed. Recovery was uninterrupted and complete.

CEREBRAL HÆMORRHAGE.

Under the head of cerebral hæmorrhage I include bleeding into the substance of the brain, or into the cavity of the ventricles. Until within a very short time, these cases have been believed to be beyond the pale of surgical interference. Indeed, Horsley, one of the boldest of cerebral operators, as late as July, 1890, advises³ tying the common carotid artery in every case of bad cerebral hæmorrhage seen within four hours after the attack; to the universal adoption of which I must protest, and I note that Krönlein, of Zurich, says⁴ it must be restricted in its general applicability. Osler, of Baltimore, also condemns⁵ any attempt at surgical correction of the trouble, except when of traumatic origin. In fact, the only authority (in the English language) that I can find encouraging operative measures, is Landon Carter Gray, of New York, who states:⁶ "In cases (other than ganglionic) thus far reported, the lesion has been in the external capsule, between the lenticular nucleus and the cortex. Alcohol, insanity and trauma are etiologically related to cortical and dural hæmorrhages, while syphilis, chronic Bright's disease and cardiac hypertrophy affect principally the basal and cerebral vessels. As regards the type known as ingravescent or progressive apoplexy, the author rather inclines to the trephine as a means of possible relief. This must be done before the blood breaks into the ventricles. To reach a hæmorrhage in these cases the best place to trephine, as Dana suggests, would be a little below and in front of the parietal eminence. To reach the internal capsule in its anterior and middle parts, he recommends that a point be located halfway between the anterior and posterior ends of the corpus striatum and the optic thalamus respectively." Almost every work explicitly advises against operation. Thus Starr, of New York, says:⁷ "It is in cortical or surface hæmorrhage only that operations can be done. If the clot be upon the external surface of the hemisphere, and produces symptoms of aphasia, hemiplegia or hemianopsia, it can be removed." The reason he assigns for objecting to operation in subcortical hæmorrhage is that "when a hæmorrhage has occurred within the hemisphere, lacerating the tracts and destroying tissue, operative interference is out of the question, for tissue once destroyed in the brain is not repaired by nature, and even were repair possible, the surgeon could

not reach and remove the clot without producing a further laceration of important cerebral structures, or serious cerebral hæmorrhage." To this I must enter a demurrer. In the first place, in cerebral hæmorrhage, the tissues are often simply *pushed apart*, without serious laceration of the tracts or destruction of tissue (except by pressure necrosis), so if the clot be removed early, permanent injury may be prevented. In the second place, the surgeon *may* cut the white matter of the brain to a very considerable extent, without pronounced harm resulting. I have many times freely incised the brain tissue without serious consequences, and in gunshot and other wounds extensive injury has often been noted with no particular symptoms arising; and in the third place, the surgeon can readily control any bleeding which he may cause—so upon the whole, I regard his position as not well taken.

In 1883 Macewen, in a case of extravasation of blood into the white substance of the motor tract, where the clot was located by the symptoms present, operated and removed the clot, with recovery of the patient. Since that time a few operations have been made. Lucas Champonnierre not long since reported to the Académie de Médecine⁸ a case of trephining for cerebral hæmorrhage. A man, aged 53, had an attack of cerebral hæmorrhage, the focus of disturbance being localized at the middle part of the precentral convolution; upon operation the remains of an old clot were found and removed, and the hemiplegia and aphasia disappeared. Champonnierre has been able to collect statistics of thirty such cases, all of which were non-traumatic in origin, with no deaths and no untoward occurrences. Encouraged by this success, in spite of the condemnation of authorities, I have operated once for cerebral hæmorrhage, not traumatic.

Case.—Dr. W. C. B., age 47, had a slight attack of cerebral hæmorrhage in the early part of 1891. I saw him at Carthage, Mo., October 10, 1891, in consultation with Dr. R. T. Scott. The following is the entry in my case book: "Patient had 'stroke of paralysis' about two weeks ago; had all the symptoms of cerebral hæmorrhage, has not entirely recovered consciousness since. Has right hemiplegia and complete aphasia; has been rapidly emaciating, has lately had paralysis of sphincters, dysphagia and fever (temperature 100° to 101° F.), strength rapidly failing, to an alarming degree past few days; indicates that he has terrible pain and tightness in head, with insomnia therefrom. At 3 P.M., assisted by Drs. Mathews, Scott, King and Schaffer, I opened the skull over motor and speech centres. No pulsation of dura. On opening dura found some softening of arm centres; enlarged fenestrum and examined speech centres; no evidence of clot there, but indications of severe pressure. Removed remnants of clot (subcortical)

and some of softened arm centre, irrigated with hot bichloride solution, 1 to 5,000, put in catgut drainage and closed. Duration, one hour and thirty-five minutes. Put to bed in good shape with little shock. Pulsation of brain returned (at opening in skull) after operation.

"October 11. Slept finely all night on morphine, gr. $\frac{1}{4}$, and atropine, gr. $\frac{1}{80}$. At 9 A.M. is feeling first rate, better than at any previous time, mind much improved, can say 'Oh yes!' quite distinctly, and can move foot to marked extent. At 4 P.M. dressed wound and removed drainage, applied large quantity of iodoform and put on permanent dressing."

The subsequent history is given by Dr. Scott thus: "Three hours after our redressing the wound the temperature dropped from 100.5° to 99.6°. On the following day (October 13), temp. 99°, pulse 110, stomach irritable; applied mustard, and ordered milk and limewater in small quantities frequently repeated. At 4 P.M. temp. 100.5°, pulse 110 and intermittent, patient restless. Gave sulphonah 55, in milk, repeated in two hours, also hydrargyri protiodid. gr. $\frac{1}{4}$ every two hours until bowels move. October 14, 9 A.M. Temp. normal, pulse 100 and regular, appetite good; can urinate without catheter. At 7 P.M., temp. normal, bowels acted freely from mercury. Having slept well the night before, sulphonah was repeated. October 15, condition improving. October 20, on removing dressings, found head as dry and clean as when first applied; wound healed by immediate union. Patient is able to sit up several hours each day, and is entirely free from headache he had prior to operation."

The patient came to Kansas City, 203 miles from Carthage, on October 30. The amount of improvement was so great as to actually shock me. And a letter written November 24, by Dr. Scott, says: "Dr. B. is still improving."

Comment is unnecessary.

BRAIN TUMOR.

Operation for brain tumor is certainly an inviting one, the result from the expectant plan being invariably fatal, generally within two years. The wonderful changes sometimes apparently wrought by internal medication are deceptive, but do not prolong life. In most instances the growth can be readily localized, and in a large proportion of cases it is within reach of the surgeon's knife. While it is probably true, as Agnew says,⁹ that "the results of operations for extirpation of brain tumors cannot be considered as particularly brilliant," from the few cases I have seen, and from the excellent results obtained by Macewen of Glasgow, Carson of St Louis,¹⁰ as well as others, I must agree with the statement of Clarence Bartlett, of Philadelphia,¹¹ that "in the absence of any reliable cure of brain tumor, one is not justified in waiting long for re-

sults if the symptoms are such as to enable him to locate the lesion accurately." As to this question of location, M. Allen Starr¹² states that about one-third of all cases occur in the basal ganglia, internal capsule, corpora quadrigemina, crura, pons and medulla, and so are inoperable. Of the remaining two-thirds, a considerable percentage must be amenable to surgical treatment. Even though the tumor may not be found, a large trephine hole may afford much relief if the button be not replaced, as in a case reported by Fischer, of Breslau,¹³ and also in a case of double trephining by Koeher,¹² to relieve symptoms when localization was impossible, the only pronounced features being choked discs, deterioration of vision, headache and unsteady gait. One opening was made anteriorly in the frontal region, with some bulging of the dura, and one posteriorly just below the tentorium cerebelli, where a hernia cerebri formed, which was removed with a Volkmann's sharp spoon, and the wound closed. Union by first intention was secured. Four days after operation the congestion of the discs had entirely disappeared and sight had improved. Seven weeks after operation the general condition was much better, sight the same, gait steadier and headache gone.

If the tumor can be located, I believe it should be removed if possible, even though it give but temporary relief. Some cases have been certainly *cured*, and the cerebral functions, strange as it may seem, entirely restored, after removal of even very large intracranial growths. Thus in a report by H. H. Mudd, of St. Louis,¹⁴ an immense echinococcus mass was removed from the brain of a girl of 12 years, it being larger than a hen's egg and located in the motor region, reaching from the convexity to the lateral ventricle. After shelling out the tumor, the wound was treated in the usual manner, the hole, large as it was, closed up, and the motor disturbances cleared up, viz.: tremor and hemiparesis, accompanied by hemianopsia and choked discs. Bremer explains¹⁴ restoration after such colossal defect by the assumption "that the fibres of the corona radiata, in which the tumor laid, were not destroyed, but merely pushed asunder; that though perhaps the myeline sheaths of these fibres were atrophied by pressure, the more resisting axis cylinders had preserved their continuity, and that complete regeneration took place."

VARIETIES.

The great majority of brain tumors are either syphilitic or tubercular—occurring as gummata or caseous masses respectively, the latter chiefly in young subjects. Other forms of tumor—more rarely met—are osteomata, sarcomata, fibromata, gliomata, carcinomata and cysts. Tumors other than those mentioned (very rare) are cysts of the

arachnoid, hydatids, plexiform angio-sarcomata, endotheliomata, etc.

Gliomata.—These growths, if not very vascular, may be easily removed. They are almost always found in the gray matter. If thoroughly extirpated recurrence is not probable and all symptoms may disappear. Thus P. Postemski, of Rome, on May 24, exhibited to the Royal Medical Academy at Rome¹⁵ a case upon which he had successfully operated some months before; all of the symptoms were gone and the woman was (apparently) completely restored to health.

Fibromata.—Fibromata springs from the meninges, are therefore easily accessible and readily subjected to extirpation. In the few cases I have been able to discover in recent literature success has been the result invariably.

Carcinomata.—Carcinomata are not frequently met in the brain; they are attended with just as great danger of return after removal as in any other part of the body. They commonly have a mass of hyperæmic and softened brain matter around the morbid growth, but in spite of this may be cut away, the adjacent tissue being cleaned out with a cutting Paquelin cautery.

Cysts.—Cysts are comparatively rare. They can ordinarily be removed without difficulty, though in a case in the practice of Dr. John Punton, of this city, operated upon by myself, there was not sufficient integrity to the cyst wall to allow of removal had such been our intention; the cyst was simply opened and a drainage-tube inserted. Experience has shown that cysts opened and drained give almost as good results as cerebral abscess.

Gummata.—Of these Horsley remarks: "Cerebral gummata should be removed—iodide of potassium palliates but does not cure them"—a statement in which all who have studied the subject must concur. The assertion of Agnew¹ may be taken as especially applicable to this class of cases. "The triumph already achieved by the conjoined labors of the neurologist and surgeon may be the harbingers of still greater ones in the future."

Sarcomata.—Sarcomata found in the head are either spindle-celled or myeloid as to variety. They may spring from the diploë, widely separating the tables, and at last breaking through with much suffering, especially if the growth be directed inward. In most instances they develop in the dura mater; the question of extirpation in such cases is of vital importance and still undecided. They frequently perforate the cranium and spread beneath the scalp, in which instance there is usually a distinct pulsation in the mass, reducibility when small and a characteristic sharp opening in the skull. I believe excision to be the correct thing, as Mansell Moulin maintains;¹⁷ the only question which arises in my mind is as to justifiability in advanced cases. In-

creasing experience in cerebral operation and (especially) observation of several cases of extensive destruction of the dura in St. Margaret's hospital in this city (under Dr. Perkins) lead me to the conclusion that we may remove a much larger portion of the dura than we have been wont to believe. I have removed an area $2\frac{1}{2}$ by $3\frac{1}{2}$ inches without apparent ill effect so far as cerebation is concerned. If the scalp and periosteum be brought over the hole so as to completely close it the brain gets on very well—in certain parts at least. In view of which I am strongly of the opinion that operations for sarcomata might be successful in more cases than now reported were surgeons less saving of the dura; and even should permanent paralysis result from interfering with motor areas such a termination is far better than death from the neoplasm.

Osteomata.—Those concerning us in our study of cerebral surgery are of the inner table or diploë (enostoses). As a rule they are of slow growth and may be left alone; but if serious symptoms arise, as displacement of the eyeball by osteoma of the frontal sinus or indications of intracranial pressure, they must be removed. A case in point is as follows:

Case.—Dr. W. L. W., aged about 35, first came under my care in the summer of 1889. He was then afflicted with aphasia and hemiplegia, of supposed syphilitic origin. There was considerable improvement after he had taken several drachms of mercury (red iodide) and some three pounds of iodide of potassium, with faradism for the paralysis; and in the autumn of 1889 I accompanied him to his home in Fairport, N. Y., and gave him into the hands of the trusted family physician who continued the treatment. February 5, 1891, he made his appearance at my office, saying he had come from New York for the purpose of having craniectomy made. I therefore placed him in the hospital for operation. My record made at this time states that "aphasia has greatly improved; disposition has changed so that patient is irritable, irascible and emotional, crying and laughing on slightest provocation; at present there is partial paralysis of entire side and complete of forearm; complains of constant priapism and constipation. Seems to be almost an imbecile at times; at others is quite rational but very emotional. Most of time passes urine in bed unconsciously—always unless drawn with catheter; has peculiar spasm of throat at times. Is very vulgar and obscene in language and careless of personal habits." On February 24, assisted by Drs. Richard Callaghan and J. W. Kyger, I opened the head with mallet and gouge over supposed site of trouble, removing the large piece of skull here exhibited: the opening was a little too far back, as at the anterior part only the bone was found greatly thickened and eburnated

—in fact the bony tumor was so hard that my large Rongeur forceps were broken in attempting to remove the growth, and the ivory-like tissue had to be cut away with carpenter's chisel and another forceps. The opening thus made measured about $1\frac{1}{2}$ inches by 3 inches, or a little more.

appeared; emotional disturbances had ceased; but paralysis remained unchanged. He was advised to go to some watering place and to use electricity for the paralysis, but unfortunately while *en route* to Waukesha he took too large a dose of morphine, and abruptly ended the case history. I believe that he would ultimately have

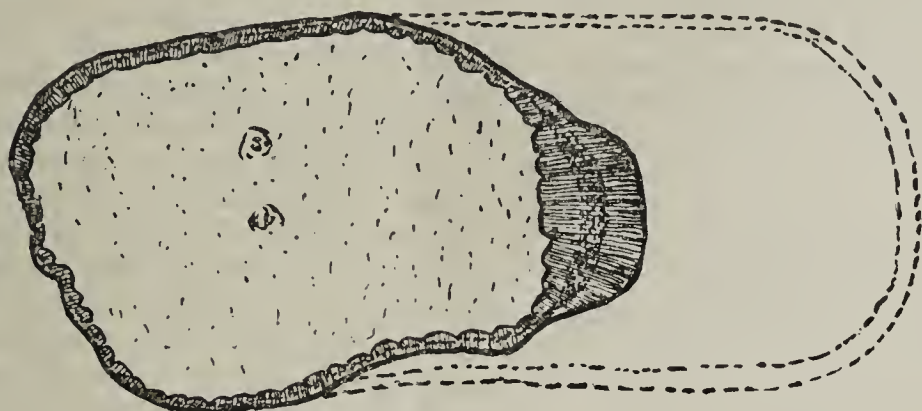


Figure 1.
Black line shows size of opening made with chisel; dotted line shows part removed with Rongeur forceps—actual size. —

This osteomatous tumor was of somewhat irregular shape, but quite smooth upon its surface; the pressure was such as to cause much bulging of the brain into the opening before the mass was taken away.

recovered because the electro-muscular contractility was not entirely lost, though almost absent in the forearm.

Cerebellar tumors (presenting symptoms of vertigo, vomiting, tenderness over the occiput,

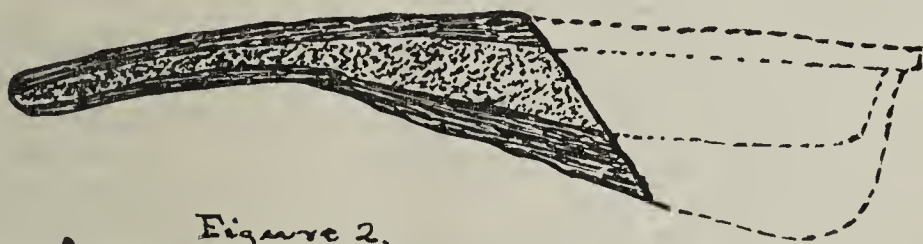


Figure 2.
Vertical section of piece removed with chisel; dotted line shows extent of tissue removed with cutting forceps—actual size. —

Examination of the brain gave negative results. The remnants of dura were sutured without drainage, but a small rubber tube was put through the scalp, and wound in the scalp and periosteum closed with catgut sutures. Patient was put to bed in good condition.

Next day patient was much brighter and called for urinal instead of wetting the bed; no fever; in the evening he went to closet for movement of bowels. On morning of second day patient insisted upon dressing and going about ward as before operation; this he did daily with no apparent harm. The drain was removed on the third day; wound healed nicely by primary union; here never was an untoward symptom.

About the first of April he was discharged; there was great improvement in mental condition; rectal and vesical troubles were gone; difficulty in talking and deglutition had entirely dis-

cerebellar ataxia and paralysis of the fourth nerve) have proven bad cases for removal. In a dispensary case which came under the joint treatment of Dr. F. B. Tiffany and myself, we made a diagnosis of tumor of the middle cerebellar peduncle of the left side; exploratory operation was offered and refused; death was sudden; the autopsy confirmed the accuracy of our diagnosis but showed that an operation would have been unsuccessful as the growth extended downward until it implicated the fourth ventricle.

ABSCESS.

Abscess of the brain, from a surgical standpoint, is more favorable than tumor. The rule now is to operate always—death is certain; relief is sure if operation be made early enough; the mortality is very slight—three out of seventeen

cases collected by Von Bergmann—as compared with 100 per cent. mortality without operation. This condition may be the result of traumatism even when the skin has not been injured nor the bone broken (Mansell Moulin). The suppuration may be either diffuse (acute cerebritis running on to suppuration and proving fatal within a few days) or circumscribed, the area of red softening growing more and more liquid in its center until it simply becomes a collection of pus. In this instance the pyogenic organisms are carried to the site of injury by the blood. The abscess might be due to impaction of pyogenic emboli from some distant focus of suppuration, as the lung, in which instance it would be located near some twig of the middle cerebral artery. In most instances it is traceable to suppuration near by, as from injury or disease of bone. Of the latter we see a typical case in abscess accompanying inflammation of the mastoid cells and in otitis media suppuration.

But, whatever the cause, as intracranial suppuration, if left to itself, is practically hopeless, the indications are always to open the skull, evacuate the pus, irrigate the abscess cavity and establish free drainage. So essential is this that when the dura is opened at the supposed seat of abscess and no pus is found, an aspirating needle may be thrust into the brain in all directions until the pus is located. I have often used a large needle in this way (even withdrawing some fluid from the ventricles) without apparent harm to the brain. Great care must be exercised not to practice this extensive exploratory work in those doubtful cases which, instead of being cerebral abscess, are thrombosis of the lateral sinus or pyæmia from middle ear disease—conditions which closely simulate abscess in their clinical picture. Here the mastoid antrum must be explored first and free communication established with the external auditory meatus; by thus doing many cases of incipient meningitis might be averted. But if no pus is found, exploratory trephining must be made either a half inch above and somewhat in front of the meatus (to explore the anterior surface of the petrous bone) or just behind the meatus and on the same level. It is best perhaps to first explore the orifice of the mastoid vein and if no evidence of thrombosis be found, to then make the opening in front, exposing the under surface of the temporo-sphenoidal lobe where the abscess is often located.

“If no abscess is found in the anterior operation either between the dura mater and the bone, or in the substance of the brain, and there is no evidence of thrombosis even when the mastoid vein is exposed, the periosteum and muscular attachments must be separated from the occipital bone beneath the superior curved line, and the lateral lobe of the cerebellum be explored. In many cases of cerebellar abscess, however, there

is sinus thrombosis as well, and there must always be some danger of one of the two being overlooked if the other is found. If extra-dural abscess or thrombosis of the lateral sinus are found, the jugular vein should at once be ligatured. The only hope lies in thoroughly cleaning out the clot and removing the whole focus of the disease.”¹⁸

“Localization in this class of cases as a rule is not difficult when the history of suppuration of the middle ear has been established. The temporal lobe or the cerebellum on the same side with the ear disease are the usual seats of these abscesses.”¹⁹ This rule should not be ignored even when localizing symptoms and history point to other regions as well, as in the case of Chas. D., to be presently mentioned.

Abscesses are quite often not single. Kidd reports²⁰ a case of double abscess; the trephine was used in the frontal region and pus evacuated from an abscess; the patient died on the fourth day and the post-mortem revealed a second and larger abscess in the temporo-sphenoidal lobe of the right side *without* (a rarity, indeed) disease of the petrous portion of the temporal bone; the cause of the frontal softening was the recent kick of a horse; that of the posterior abscess was unknown—it usually being due to caries and often existing for months or years. A case almost precisely similar was lately operated upon by myself.

Case.—Chas. D., age 32 years, patient of Drs. Kestler and Mosher, received a blow upon the right side of the head by a cable-car on the night of Sept. 18, 1891. He was stunned for a little time but recovered and went about his business next morning, though his employer noticed that he acted strangely—“dazed” as he expressed it. This condition continued until about October 11, 1891, when he had to go to bed on account of the increasing headache, especially marked at the junction of occipital and parietal bones of the right side. He developed fever, had a severe general convulsion, repeated chills at irregular intervals, and finally became delirious and semi-comatose. I first saw him October 18, in consultation with the doctors, but as there appeared to be marked amelioration of the symptoms it was decided that an operation should be deferred. He soon became worse again and continued to decline until the 23d. At 2 P.M., the doctors determined to have the operation made and at 4 P.M., arrangements were completed; but at that hour patient was in profound collapse, pulse weak and intermittent, extremities cold, eyes strongly turned to the left and insensible to light. Operation was therefore again postponed, stimulants being used vigorously. At 9 o'clock, October 25, we again met, Drs. C. D. McDonald and E. W. Myers being also present.

Upon opening the skull (about one and one-

half inches behind and a little above the external meatus of the right side) the dura bulged prominently into the hole, and was entirely without pulsation. On turning back the dura a large area of softened brain tissue presented—not yet broken down into pus, there being only a little spot of complete fluidification; this was scooped away and the surrounding red softening curetted with a sharp spoon and touched with the Paquelin cautery. A needle was now thrust in two or three directions without finding pus, but indicating quite extensive softening; this was very apparent to the touch of the finger also. After irrigation a drainage tube was inserted and the usual dressings applied. There seemed to be a slight improvement that day in his mental condition, but he suffered considerably from shock. On the evening of October 27, we dressed the wound; upon opening it up about one and one-fourth ounces of pus and broken down brain matter escaped. Dressings were reapplied and patient made easy, but he continued to sink and died next morning from shock and exhaustion.

The autopsy showed another abscess, evidently of months' standing, in the left side, due to caries of the petrous bone. While this had existed for a long time, the only evidence, presented *ante mortem*, was a chronic discharge from the middle ear and an occasional sharp pain in the occipital region of the left side. Death, in my opinion, was due to the recent abscess for which operation was made, though the concussion producing it may have set up trouble at the old focal lesion. Sooner or later, however, the latter would undoubtedly have caused death if not recognized and emptied.

In connection with the subject of abscess, it is of interest to note that Orlow has reported²¹ the history of a woman, aged 27, who was affected by suppurating thrombosis of the lateral sinus, diagnosed by symptoms and successfully treated by trephining. Briggs (C. S.), of Nashville, has had a somewhat similar case; operation for sinus thrombosis is quite common in malarial disease.

CEPHALALGIA.

Although it may seem rash to advise opening the skull for a thing apparently so simple as headache, there are certain cases of cephalalgia which resist all therapeutic measures; where such prove persistent and intractable, trephining should not be forgotten. Keen has operated once for intense headache following a blow, with complete relief from pain. Agnew⁹ reports two cases of persistent headache not relieved by medical treatment, one cured and one improved. Martin, of Philadelphia, is quoted by Agnew as having had a cure following operation for headache. Horsley has operated four times with four

cures. Prewitt, of St. Louis, twice with like result, and a number of other operators have had similar success.

In one case of almost unbearable headache which came under my own care in 1890, trephining completely relieved the distress, and permanently. I believe Victor Horsley is correct in advising that trephining be done in all cases of headache which prove refractory to other measures. Especially is this true of localized headaches and also when the pain seems to be the result of injury.

INSANITY.

The suggestion to open the skull in insanity is not new, but its execution is recent. Burckhardt²² has detailed six cases of insanity with marked hallucinations, which he subjected to operative treatment. "In two cases he aimed to intersect the paths of association which he thinks transmit the impression coming from sensory parts and certain ideogenic areas of the brain. A portion of the frontal and parietal lobes, before and behind the ascending convolutions, were removed with very satisfactory results in one case, the other being still under treatment. In the other four cases the hallucinations were more or less acute, and in these cases the operator attacked the centers through whose injury sensory and motor aphasia are produced, and removed a part of the first temporal and third frontal on the left side, which appeared diseased, and with satisfactory results. It is possible that, with additional experience and a minute study of the pathological changes seen in the brain, the knife may be the means of restoring to reason many cases now considered incurable." But the question naturally arises: were or not these cures the result of the operation *per se*? Only further experimentation and careful observation can determine. It is in the first stage of general paresis that I shall look for beneficial results, for here we have a mental disease (so-called) which is dependent upon gross lesions. In insanities dependent upon intra-cranial growths, the indications are always to operate.

EPILEPSY.

The question as to the propriety of operating for epilepsy, traumatic or otherwise, has been much discussed. There certainly appears to be much to base hopes upon, but results have not been altogether satisfactory—in fact, while there have been some very brilliant cures, especially when due to trauma, no improvement has been secured in a large proportion of cases. Personally I have operated once—a dismal failure. But I am persuaded to try it again by reports such as that of Péan.²³ Patient for years suffered from inherited epilepsy, not traumatic; internal medication failed. There was no localizing symp-

tom save pain, but an operation was made at the seat of pain and an angioma removed from the meninges, and implicating the superior longitudinal sinus. Cure has been complete and unquestioned.

Victor Horsley is a strong advocate of trephining for epilepsy; but upon the other hand White, of Philadelphia, regards²⁴ improvement as only temporary, and dependent upon the mental impression, and Agnew positively states, "traumatic epilepsy is practically incurable by surgical operation," though he admits there are cases on which internal medication exerts no controlling influence that may be with great propriety subjected to operation, and cites the 102 cases collected by Laurient²⁵ with 54 per cent. cured. But, he says—and too much emphasis cannot be laid upon it—it is not too much to assume that surgery is responsible for the great majority of traumatic epilepsies, because of poor treatment at the time of injury, the doctrine that depressed fractures of the skull without symptoms require no operative treatment being responsible for many unfortunate sequelæ. I quote his own words: "However small may be the depression which follows a fracture of the cranium, save in one or two localities, it will encroach enough upon the dural nerves to cause more or less irritation, which, though insignificant at first, and not at all recognizable to the consciousness of the patient, yet eventually that irritation will be propagated to the cortex and brain ganglia, until finally the paroxysmal explosion occurs. . . . Whenever, therefore, in my judgment, the profession can accept the doctrine that *all depressed fractures of the cranium, however slight may be the depression, and entirely irrespective of pressure symptoms, are proper subjects for trephining*, then will traumatic epilepsy largely disappear."

Jacksonian Epilepsy.—In cases of limited epilepsy, or whenever the convulsion invariably begins in the same muscle or group of muscles, exploratory trephining is surely indicated, though as yet cases are too few and results too unstudied to warrant any definite promise of success. Parkes, of Chicago, warmly recommended operation, and others have been equally enthusiastic.

TUBERCULAR MENINGITIS.

Here is a disease wholly incurable by any method thus far devised. Some months ago I wrote:²⁶ "It is not unlikely that the time will come when we will boldly open the skull and wash out the meningeal spaces in cases of tubercular meningitis, as we do the belly in tubercular peritonitis. The peculiar disappearance of the tubercular process in peritonitis treated by flushing the abdomen, leads to the inevitable conclusion that a similar result may be anticipated in the analogous condition, tubercular

meningitis, especially when complicated with hydrocephalus."

Scarcely a week had passed when I was called upon to operate. I immediately addressed letters to Profs. Senn, of Chicago, and Keen, of Philadelphia, asking if operation were justifiable. The one replied: "I would tap with a small trocar under strictest antiseptic precautions, and inject 2 drachms of a 10 per cent. iodoform-glycerine emulsion, and repeat as often as necessary"—practically the same treatment as had proven so successful in tuberculosis of joints; the other advocated opening the skull, tapping the ventricles, irrigation and drainage. But the patient died before receiving their replies, and I was probably spared the necessity of adding a third fatal case to my list. It does seem to me, however, that something may be done in a surgical way for these fatal cases.

MICROCEPHALUS.

Last year Lannelogue, of Paris, proposed an operation for the relief of idiocy dependent upon microcephalus, believing the deficient cerebral development to be the result of premature closure of the fontanelles and sutures. This operation, which he calls craniectomy, he has performed twenty-four times, with varying degrees of success. Keen has also operated—in one case with marked improvement—but he believes simple trephining will accomplish as much as the more formidable linear craniectomy. Wyeth, of New York, has done the linear operation four times with two deaths, and decided improvement in one case. Van Lennep, of Philadelphia,²⁷ has operated twice—one child died three days after operation, the other, a boy 5 years old, has improved slightly. McClintock, of Topeka,²⁸ has made one operation, with very decided improvement. Other men have operated without death, but it is too early to report as to success or failure.

Two cases have been operated upon in Kansas City: one by Dr. J. F. Binnie, and one by myself. Both children died from shock. The history of my operation is as follows:

Lydia H., age 11 years, patient of Dr. John Punton. Was hurt when about 18 months old by a fall; picked up in an unconscious state. It was found that the right knee was injured. Convulsions recurred for some time after the injury. Condition of knee grew worse. At age of 5 years had scarlet fever, causing otitis media of left side, which was cured after a few months. Though lame, she at 7 went to school and began to learn to read. Soon afterward she had a severe spasm, repeated at frequent intervals for twenty-four hours, and since that time convulsions have been more or less frequent—at first at quite long intervals, but gradually increasing in frequency and intensity, until the average is from

twelve to twenty each week. In 1888 she lost her speech, and has not spoken since; this was accompanied by hemiparesis of left side. In 1889 leg was amputated for tumor albus; since operation left ear has again discharged, but hearing in right ear is good. Case came under care of Dr. Punton one year ago, and was placed on large doses of bromides, which seemed to control the spasms at first, but they soon returned as bad as before. She was greatly emaciated, but upon discontinuance of the bromides, under tonics and forced feeding, has much improved physically.

I first saw the case October 18, 1891, and made the following note: "Patient well developed physically; head unusually small and unsymmetrical, occiput being very prominent, especially on right side, face blank and expressionless, eye bright, and of the peculiar staring and restless character so often noticed in microcephalic children, pupils much dilated. Discharge from left ear; speechless, pays very little attention to what is said or done, lies upon floor and plays idly (for hours, it is said), with little pieces of wood; passes urine and fæces in diaper, apparently without notice, has to be fed—in fact, lives a purely vegetative life. Is said to be irritable and vicious, *i. e.*, liable to harm others if not watched. At times is said to be much brighter, but for weeks at a time will seem to be oblivious to surroundings. At such times is apt to have many convulsions."

November 1, 1891, assisted by Drs. Eggers and Punton, I opened the skull on the left side, over the Rolandic fissure and the speech centre. There was some bulging of the dura, and no impulse. Upon opening the meninges, suspecting a cyst, I pushed an aspirating needle 1 inch into the brain, and withdrew 6 drachms of serous fluid. The needle was followed down with a bistoury, a free opening made, and drainage established. The dura was brought together with one or two sutures, and the scalp closed with continuous suture, except at point of drainage. The scalp was then reflected from the right side, and a linear craniectomy made, the opening being $\frac{3}{4}$ inch wide and $4\frac{1}{2}$ inches long. The dura was opened to permit inspection of the motor areas. There was distinct cloudy infiltrate in the pia mater, with adhesions to the convolutions in the arm and leg centres. The opening was enlarged with Rongeur forceps, because of *extreme* tension over motor areas; the adhesions were broken up, wound irrigated, dura closed, drainage tube to dura, and scalp closed. Duration of operation, one hour and forty minutes.

Patient was put to bed with profound shock, from which she never rallied. Upon recovering from the anæsthetic, there was a look of intelligence and brightness about the face that made the friends exclaim, "That change is enough to justify any operation." But in spite of vigorous

measures, she died at the end of forty hours.

Autopsy.—Nov. 4, 1891. Post-mortem examination held fifteen hours after death. Present: Drs. John Punton, J. T. Eggers, J. N. Jackson and Emory Lanphear. Rigor mortis well marked. Wounds in good condition. Upon removing calvaria pachymeningitis of long standing well marked everywhere. Right brain much smaller than left, and whole far smaller than normal; brain paler than natural. Sinuses empty, but vessels of pia much injected. Chronic inflammation of pia extensive. Dissection of brain revealed a cyst a little larger than a pigeon's egg in the speech convolutions a half inch below the surface, and encroaching upon the second frontal convolution. It was surrounded by a somewhat softened condition of the white substance, and walls of cyst were very thin. Frontal gyri not well developed.

Here was a case that promised something, and I am sure, had life been preserved, that there would have been some improvement, although speech could probably have never been restored; though what the developmental process might have brought forth is problematical.

I certainly cannot agree with Bremer that linear craniectomy for microcephalus is a bad operation. Of course, where there is a primary lack of cerebral development, closure of sutures being secondary, nothing can be expected from surgery; but there can be absolutely no doubt that some cases of defective mental development are secondary to premature closure of the skull, and in such craniectomy is certainly not only justifiable, but promises success in at least a moderate percentage of cases. So far as I can learn, the primary mortality is about 11 per cent.

METHOD OF OPERATION.

Whenever possible, the head is shaved on the day before operation, and an antiseptic dressing applied after careful scrubbing with soap and water. When the patient is anæsthetized (chloroform *always* being employed, because of contracting the cerebral vessels, and less liable to cause vomiting), the scalp is thoroughly scrubbed with brush, soap and water, dried, washed with ether, and then with bichloride solution, 1-1000. At this point, $\frac{1}{4}$ grain of morphine may advantageously be injected hypodermatically. A row of sutures are run "back stitch" around the field of operation to control bleeding from the scalp. A large flap is made, the cut being clean, and carried through the periosteum; a silk suture may be run through this flap as it is reflected and given to an assistant to hold. The method of entering the skull varies according to the habit and skill of the operator. Personally, I prefer the Galt trephine for fractures and the like, but for extensive openings I use the gouge, Rongeur and mallet and chisel. In twenty-three

operations I have never seen any bad effect follow their use, unless it be in the last case reported. Too heavy blows may, of course, produce shock, as Agnew has pointed out, but, by not too vertical position, and with gentle taps, the skull may be opened far more safely than with the trephine. If the primary opening is found to be too small, it may be enlarged with the Rongeur. If one desires to replace the chips, they are put in a mild bichloride solution of a temperature of 105° F., and when ready, are put back upon the dura in a kind of mosaic; these will grow to their place again, as practiced by Macewen, Adamkiewicz, and others; or we may fill the cavity with decalcified bone chips, after the manner of Senn, or even transplant from the goose, as in Jaksch's celebrated case. But I cannot see any special advantage in this (except in cases of extensive traumatism, where a large part of the brain is exposed, or in operation for neoplasm), as in operative cases we usually wish to remove intracranial pressure; besides, the opening is so promptly and satisfactorily filled with fibrous tissue that it is useless trouble, and the pieces *may* act as a foreign body.

The incision through the dura may be crucial or preferably made to follow the line of incision through the bone about one eighth of an inch from the margin, and extending three fourths around the circumference. The meningeal arteries may be caught with forceps and tied with fine gut, as anywhere else in the body. Hæmorrhage was formally greatly feared. Indeed, four years ago, when I accidentally cut the superior longitudinal sinus, I did not know how to control the bleeding, so I clasped it and the bone in a pair of forceps, and left the latter *in situ* for four days—with recovery; it was a case of gunshot wound, and not included in this list of cases. But now we have learned that the sinus can sometimes be tied, and if not, hæmorrhage can be checked by packing with iodoform gauze. Even in rupture of the lateral sinus this expedient has repeatedly proven efficient. For tying vessels of the meninges and brain, I employ juniper-oil gut, carefully prepared and softened. Bleeding from the diploë gave me much trouble in my earlier operations, and the use of wax, etc., was unsatisfactory and unscientific; now I simply punch the bleeding points with the handle of some convenient instrument, or even crush the bone if necessary. For small vessels in the substance of the brain, hot water irrigation usually suffices; but if persistent, they may be touched with the tip of a Paquelin cautery, or the wound packed with iodoform gauze. As the arteries which supply the brain itself are terminal, every vessel should be scrupulously maintained if possible; many times, as Horsley has shown, they can be lifted out of the sulci and preserved.

Hot water (115° F.), previously boiled, should be at hand to check bleeding, and, furthermore, for the purpose of douching the wound and head when symptoms of collapse appear. It has a wonderful effect in restoring the pulse and preventing shock.

In operating for tumor, if the growth does not present by simple inspection, palpation may detect it, and if not, the cortical substance may be cut through and the incision carried into the white substance. Such incision must be vertical, and directed into the corona radiata, avoiding, when possible, injury to other fibres, especially those going to the internal capsule. The gap in the brain caused by the removal of a tumor rapidly fills by eversion of the cut corona radiata and by granulation tissue, if large.

When the work has been done, the wound is carefully irrigated, and the flap of dura turned back into place. I always suture the dura with finest catgut, unless there be some strong contra-indication. Few cases require a drain through the dura. A few strands of gut or a small drainage tube may be placed under the scalp, iodoform dusted in, the scalp sewed, and the wound dressed as any simple cut.

Shock is one of the great drawbacks to cerebral operations. In one of my two fatal cases, death undoubtedly occurred from this cause. Whenever possible, the patient should have a rest in bed for a few days before operation (unless very robust), with stimulants and forced feeding. At the time of operation, Champonierre advises one-tenth of a grain of sulphate of strychnine hypodermatically after the patient is under the influence of the anæsthetic. After the operation, the head must be kept low, the body very warm, and the usual remedies for shock employed (alcohol, digitalis). The after-treatment is the same as that of any other capital operation.

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SOCIETY PROCEEDINGS.

Medical and Chirurgical State Faculty of
Maryland.

Semi-annual Meeting, held at Rockville, Md., November 17 and 18, 1891.

President, Dr. Wm. H. Welch; Secretaries,
Drs. Robert T. Wilson and William B. Canfield.

TUESDAY, NOVEMBER 17—FIRST DAY.

The meeting was called to order by the President, and Dr. E. E. Stonestreet, of Rockville, delivered the

ADDRESS OF WELCOME,

in which he regretted the illness of Dr. Maddox, and after recalling the early days of that part of the country, he welcomed the members of the Society in the name of the Montgomery County Medical Society. Dr. Wm. H. Welch, the President, in reply, thanked the County Society for its hearty welcome, and said it was a special pleasure to accept their kind invitation, because it was given so heartily. It was the desire of the State Society to make it a representative body and include all the local societies. He was glad to see such a large number, and hoped they would all feel at liberty to enter into the discussion.

Dr. Wm. H. Welch then delivered the President's Address, on

THE BACILLUS COLI COMMUNIS; THE CONDITIONS
OF ITS INVASION IN THE HUMAN BODY, AND
ITS PATHOGENIC PROPERTIES.

He began by saying that it might be considered rather remote from the interests of practical medicine to consider this subject; its study might not help diagnosis or treatment, but it was of the greatest interest, and in this case he thought he had something new to communicate. The invasion into the circulation or system of the bacillus coli communis had been always regarded as unimportant, and this organism was supposed to have no pathogenic properties; but now we know it has. It has long been known that a great many different kinds of low forms of life are in the fæces, and it has been thought that it was hopeless to try to classify them. Dr. Woodward, of Washington, has studied them very carefully, and has shown that the great mass of the fæces consists principally of low forms of life. He did not classify the different species. It was not supposed that there were any bacterial flora there. We owe to Escherich, of Gratz, the knowledge of the fact that there are certain species of bacteria which have their habitat in the intestinal canal, and are found comparatively infrequently

elsewhere. Of these the most important, because the most commonly found, is the bacillus coli communis. In 1885 he made his first contribution on the subject, his studies being based on the examination of the stools of nursing infants. He found this bacillus predominating. It is described as a short rod with rounded ends, about one-fourth to one-half the diameter of a red blood corpuscle; it is plump as compared with the tubercle bacillus. It has very little characteristic in its form. It is like many organisms which we already know. The typhoid bacillus resembles it so closely in its form, that one would not be able by the appearance alone, to distinguish them, but they can be distinguished by culture media. It is feebly motile according to some, and non-motile according to others. It grows in various culture media, in bouillon, in gelatin, in agar-agar and in a roll culture, the colonies are seen very faintly with the naked eye. The method of study is familiar to all bacteriologists. A sterilized platinum needle is passed into the substance to be examined, and then put into the liquefied agar-agar; this is then rolled horizontally on a piece of ice until the medium is deposited in a thin film on the inside of the tube, which is put in the thermostat over night, and the result is these small colonies which you see here. Their growth and reaction may be also noticed in milk. Add litmus to the milk, and then inoculate it with the pure culture of the typhoid bacillus and of the bacillus coli communis, and in the former case the milk remains fluid, and in the latter case the milk is coagulated. It is important to know whether the bacillus coli communis has pathogenic properties or not. The answer to this is equally important, whether positive or negative. In typhoid fever, the trouble is we cannot find an animal susceptible to the typhoid bacillus. When an organism enters the body, it causes disease either by infection or by intoxication. Infection is when the organism multiplies in the body, and intoxication is when the organism emits a poison. The bacillus coli communis causes an infection, not an intoxication. In experiments on rabbits, he injected a pure culture of this organism, and the animals emaciated and died in two or three months. At the autopsy it looked as if death was caused by the organism getting into the gall bladder. The effect seems to be according to the amount inoculated. He came across this organism in a case of pancreatitis. The etiology of this disease, which Dr. Reginald Fitz, of Boston, had so thoroughly written up, is obscure. Cultures were made from this case. It is not a post-mortem organism. When found in the body, it is a sign that it got there after death. At the Johns Hopkins Hospital, the autopsies are made soon after death, and thus the danger of post-mortem organisms

is reduced to a minimum. The abdomen was opened, and a large flat knife, which had been heated in the flame, was laid on the pancreas, thus destroying all organisms that might be on the surface of that organ; then the sterilized platinum needle was plunged into the substance of that organ, and the œse brought up a little speck of substance, which was put into the culture medium. In the case just mentioned, in which the bacillus coli communis was found in pure culture, there was a diphtheritic-looking condition of the intestinal mucous membrane. The organism probably made its way through the diseased intestinal mucous membrane, and thus got to other organs. He had found it in no less than thirty-three of the 250 autopsies which he had performed at the Johns Hopkins Hospital. All of these had a lesion of the intestinal canal. All had dysentery and a diphtheritic-looking condition of the large or small intestine. There were hæmorrhages, ecchymoses, typhoid ulcerations. The question to be asked is: "Is the invasion of this bacillus of practical interest or not; does it do harm?" There is no evidence that it does, but in some cases it seems to. He had had some cases at the hospital of dysentery caused by the amœba coli. In these cases, which were usually fatal, he had found with considerable constancy the bacillus coli communis. It may be a factor of some importance. There are cases in which the organisms do injury. He had seen several cases of peritonitis of late; this is a most common cause of perforation. The peritoneal fluid was examined, and it was found to be a pure culture of the bacillus coli communis. He had seen a number of cases in which this organism had caused an infection of the laparotomy wound. He had seen six cases in all. In a number of these cases there had been numerous adhesions. It caused fever, and prevented union by first intention. It also does harm in the secondary broncho-pneumonias. It is caused by some lesion in the intestinal tract. Fraenkel found this a common cause of peritonitis in one-third of his cases. The streptococcus and staphylococcus were also found.

Dr. Ernest Black, of London, thought that more and more light was needed on the precise nature of the products of decomposition formed by the bacilli. He asked Dr. Welch what power the bacillus coli communis had to be decomposed and be absorbed by the healthy mucous membrane?

Dr. Welch replied that this organism is not known to produce injurious chemical substances. Lactic and acetic acids are produced in the fermentation of milk. We have very little work done on the subject, but he does not believe absorption takes place.

Dr. George J. Preston read a paper on

THE REST CURE, AND CASES TO WHICH IT IS APPLICABLE.

He referred to Hodge's experiments, and changes produced in nerve cells by stimulation, and the restoration of these cells by rest. Hence the rest cure has a physiological basis. The natural relief of pain is rest. The necessary things in a rest cure are, isolation, rest, forced feeding and artificial exercise. Isolation should be used with bad cases. No one but the doctor and nurse should see the patient. She should be removed from home, and should have no communication with her family or friends. The diet should be regulated with great care; baths, friction and massage should be used where indicated. Milk should form a very large part of her nourishment. Electricity should be used, particularly the faradic current; also cold sponging and cold spinal douches. To what class of cases this is applicable, it is hard to say. There is a distinctive and easily recognizable class of cases to which this treatment applies.

Dr. T. A. Ashby, of Baltimore, said that the principles of treatment as laid down by Dr. Preston were important both to medical and surgical cases. He had had a number of cases in his own practice, where the rest treatment had been of incalculable benefit. He thought the ovaries were removed too often. Patients do much better when removed to a hospital, out of the reach of sympathizing friends. He agreed with Dr. Preston when he said that the surgeon might just as well remove the testicles for seminal emissions, as remove the ovaries of a neurasthenic.

Dr. Robert T. Wilson thanked Dr. Preston for his paper, and seconded what he had said, because he had had the same kind of experience in his own practice. He then related a case illustrative of this point.

Dr. Roger Brooke, of Oakdale, was very glad to hear the paper, and thought such work was productive of much good.

Dr. Black thought that forced feeding was of the greatest importance, and advocated especially peptonized enemata. There are many cases in which the patient, even with the most perfect rest, will not show improvement until they are put on forced feeding.

Dr. Welch said that the work of Hodge was decisive. The prolonged irritation of a nerve causes a change in its cells. This shows that a prolonged and continued functional disturbance may cause an organic disease. Thus Hodge found that prolonged cases of neuralgia will cause an organic disease of the nerve, and Thoma showed that the blood vessels in the neighborhood of this irritated nerve underwent a hypertrophy of their walls. Dr. Putnam, of Boston, has shown that organic disease of the nerves will follow a reflex irritation of that nerve. He was

susceptible on this point at first, but now he believed it.

Dr. Edward Anderson, of Rockville, showed an old medical work published in the last century showing that antiseptic surgery was thought of at that early date. He also exhibited an old account book of his father's kept in pounds, shillings and pence, more than a hundred years ago in that county.

Dr. Anderson then read a paper on

TYPHOID FEVER.

This disease came from the same cause, whether lasting long or short, whether mild or severe. If mild it was sometimes called malaria, gastric fever, and in some cases it was called typho-malarial fever. These names should not exist. He would call it headache fever, for that symptom is never absent, although all the more commonly present symptoms may be absent. Typhoid fever is the scourge of Montgomery county. Rockville is the home of this disease. This should not be so, for except for man's intervention there is not a healthier place anywhere. But not a house on the main street that had not been visited by this disease, and nearly every family in the town had had some member suffer from the disease. In his experience it either killed in a few weeks or else it left the subject in a better condition than he was before. The town was situated on three streets, which ran parallel. During wet weather there was no danger, but as soon as the streets dried, which they did in a few hours after the rain ceased, the clayey dust carried the disease. The side streets were generally wet, hence there was not so much disease on them as on the main street. In one house he had seven cases in a short time and in another five. He quoted several cases, and gave his plans of treatment.

Dr. T. A. Ashby, of Baltimore, thought it was generally caused by drinking-water, and said it was only strange that we did not have more cases in the country than we do.

Dr. Preston said that the proof of the spread of this disease by drinking-water was the fact that there is comparatively little typhoid fever in the cities, and many cases that do occur are brought from the country. Milk is also a cause. A field fertilized by human dejecta may be the cause of spreading the disease. He had noticed that one year the cases were mild and the next year they were severe. This year they were very mild. The cases that were lost were those that applied for treatment too late, in the last stages of the disease, and had been walking about. He objected to milk as an article of diet in this disease. Not only was it a good culture-medium for the organisms, but on account of its casein it was very indigestible in this disease. He had a strong preference for egg white as a substitute.

Dr. Henry U. Onderdonk, of College of St. James, said he had had an opportunity to examine a large number of samples of water for physicians of the region, and he had found chlorides, nitrites, nitrates, and each sample was backed up by one or more cases of typhoid fever. In one case the water seemed to be pure, and yet there was the typhoid fever.

Dr. J. McP. Scott, of Hagerstown, said this was a subject always interesting. He thought it was doubtful that the disease came from certain soils. In Munich the disease disappeared with the improvement of the drainage. He thought there was no special plan of treatment, only the less the better.

The faculty then resolved itself into a convention and appointed Drs. T. A. Ashby, J. J. Preston, of Baltimore, J. McP. Scott, of Hagerstown, W. Frank Hines, of Chestertown, and Edward Anderson, of Rockville, a committee of five to confer with other committees to frame a proper law for the regulation of the practice of medicine in Maryland, to be presented to the next legislature.

Dr. Welch, in continuing the discussion on typhoid fever, thought it was important to study the cases that differed from the usual forms. Much harm had been done by the text books by their descriptions of this disease. There are cases without the usually noted symptoms and cases with them. The cases of constipated typhoid fever are by no means the most favorable. Some cases assume the disguise of Bright's disease. The continued fever seems to be the symptom most common to all types. Harm has been done by setting up the type of typho-malarial. The two diseases may be combined, but not often. Such a term is used to cover up the ignorance of the physician. We have means of recognizing malaria by examining the blood. If the malarial organisms are present we have malaria, if they are absent then we have no malaria. Typhoid fever is a disease which the physician should have in mind whenever he is called to attend a case of continued fever. He then related a case of walking typhoid fever. The patient had simply complained of sore throat, and had gone nearly every day to his physician. One day, on leaving the office, he fell dead on the street. It is a tricky disease and may assume all sorts of disguises. It is a novel thing to hear the ground hypothesis advocated in this country at the present day. The drinking-water is so generally considered the cause, especially in the opinion of Americans and English, that the ground hypothesis is in the back ground. Pettenkofer, who is a hygienist in the strictest sense of the term, is the leader of the ground hypothesis, while the bacteriological school of Koch is a strong adherent to the drinking-water theory. Typhoid fever may originate in various ways.

It generally comes from drinking-water, but it may not be impossible for it to develop in the way Dr. Anderson has said. Uffelmann found that it lived in the earth a year. The typhoid bacillus does not form spores, but it is very resistant. It may be taken in with the dust. The ground hypothesis cannot be denied entirely. Uncooked food may possibly cause it. Impure water may infect without being drunk; it may contaminate the vessels in washing them. It is well known that milk will cause the disease. The bacillus does not get in from sewer gas, but families returning to a house that has been closed for a long time may get the disease from the fact that the water in the drain and water closet pipes has evaporated, and any dried matter in these pipes, containing, among other things, the typhoid bacillus, may be wafted into the house by backward currents of air and cause the disease. In such cases the place just left, usually a summer resort, is blamed. In Munich the introduction of good water had no effect, but improvement of the drainage caused the disease to disappear at once. In Hamburg the reverse was true. The typhoid bacillus is not choice in what it eats. It will grow on almost anything. The fact that this bacillus grows readily in milk is no reason why we should deprive our patients of milk. As the bacillus will grow on almost anything, we should have to starve our patients in order to protect them. Besides, it is not so much keeping the organism from getting into the body, as to keep the body strong enough to throw off attacks of the bacillus. There is no substance which contains as much nutritive matter as milk, and nothing is better than it in typhoid fever.

Dr. E. E. Stonestreet, of Rockville, said that he had always thought that water was at fault in typhoid fever, and mentioned several cases of his own. This paper was further discussed by Drs. C. L. G. Anderson, of Hagerstown, Hines, Ashby and others.

TUESDAY, NOVEMBER 18—SECOND DAY.

Dr. T. A. Ashby then read a paper on
APPENDICITIS IN THE FEMALE, WITH REPORT OF
TWO CASES.

He thought that this trouble occurred frequently in the female when it was not recognized, because the pus escaped by the vagina or in other ways. He related two cases.

Dr. Welch said that he had had some little experience in this disease, and thought that Dr. Ashby had called our attention to a very interesting subject, one little investigated, and this paper should prove an incentive to further investigation. The reason it is supposed to be so much more common in the male than in the female is because statistics are not properly collected. This is difficult. Proportionately there

are more males than females in hospital, but like cancer of the stomach it is no more common in males than in females. There are special causative differences in the two sexes. One case which he had seen at the hospital was one of extra-uterine pregnancy. It was tubal. The diagnosis had not been made before she entered the hospital. The third week the sac ruptured into the peritoneal cavity and there was profuse hæmorrhage. The patient was better in a week. The diagnosis was made by withdrawing with a sterilized needle, a little fluid from the peritoneal cavity, and this fluid, which was blood, was found to be a pure culture of the bacillus coli communis. This showed a perforation of the intestinal canal, for how else could this organism have got in? The diagnosis was confirmed subsequently. This was the only thing about the case that led to a suspicion of appendicitis. An operation was decided on and laparotomy was performed. As soon as the peritoneal cavity was opened the blood spurted out seven inches high and three inches thick. The patient died almost at once. The autopsy showed an appendicitis and diffuse peritonitis. There had been a tubal pregnancy on the right side, which had ruptured. The diagnosis was made with the microscope. The appendix was adherent to the sac on the right side, and this is probable. It is probable that the appendix was ruptured in rupture of the sac. This is interesting, the diagnosis resting on the bacteriological examination, and the sudden death. The patient had shortly before had a hæmorrhage into the peritoneal cavity; the tension was excessive, which compressed all the viscera and the blood vessels. This is different from the collection of an ascitic fluid, because that is a gradual accumulation and the vessels have time to accustom themselves to the change. The volume of blood in this case was diminished by the hæmorrhage. The abdominal vessels can contain all the blood of the body, and in this operation, the pressure being suddenly let up, the blood was drawn from all other parts of the body by suction and the circulation could not be kept up. In these cases salt solution injected into the blood vessels does as much good as blood, and is not so dangerous. This patient died of "hæmorrhage into her own vessels."

A still more interesting case was that of a negro, aged about 21, married three years, had had two miscarriages, and developed during the last six months great pain and weakness in the back and side, and leucorrhœa. She was not incapacitated for work. She came into hospital. Examination showed that the cervix was low down and enlarged, os patulous. On the left side was a fluctuating mass as large as a lemon; on the right there was nothing. Diagnosis, pyosalpinx of the left side. Laparotomy was

performed and the left ovary and tube removed. The fimbriated extremity was obliterated, ovary not involved. On the right there was no pyosalpinx, but evidences of disease. The contents of the right Fallopian tube were muco-purulent. The vermiform appendix was adherent to the right tube. A culture made from the pus in the left tube was negative and sterile. This is the usual result, and it is surprising. These are gonorrhœal, and later on the organism disappears; still it does not grow in the usual culture media, so that when we find such a case where there is no growth, we consider it gonorrhœal. He made cultures from the right Fallopian tube and found small cultures; they were the streptococcus pyogenes, the most virulent of the pus-producing organisms. He thought this was a case where the inflamed vermiform appendix had set up by adhesion a salpingitis. This is another cause added to the list of causes of this trouble. The finding of the streptococcus makes the prognosis worse than if other forms were found. It is the organism of puerperal fever and septicæmia. This patient was isolated and a drainage tube was not inserted, as he considered it a source of danger. The temperature went up to 104°, and she died soon after the operation. The autopsy showed a duodenal ulcer, an unexpected complication. There may be a relation between the ulcer and this case; he had seen three others like it, but could not trace the connection.

Dr. Robert T. Wilson, of Baltimore, then read a paper on

LAPAROTOMY FOR REMOVAL OF A PURULENT TUMOR OF THE RIGHT OVARY.

This was not a suppurating cystoma of the ovary, but an abscess *per se*. The tumor was as large as an infant's head. He put on the clamp, cut it off, applied Monsel's solution, put back the stump, and closed up the wound with antiseptic precautions. In order to give good drainage, he put in a tube. He thought it was important, after such operations, either to put in a drainage tube or an iodoform-gauze tent. The patient made a good recovery.

Dr. Ashby said it was interesting because it showed the difficulty in diagnosing these cases. He had had several such cases, but in none was the ovary so large.

Dr. Welch said that abscess of the ovary was rare, as Dr. Wilson had said. He had seen a few cases, but none so large as this. Suppurating disorders are caused by microorganisms, and it is difficult for organisms to get into the ovarian structure. In pelvic peritonitis they do not have to penetrate. The tunica of the ovary is so thick that organisms do not readily penetrate it. The different tissues react more or less readily to the invasion of bacteria, but the stroma of the ovary is not prone to suppurate. He men-

tioned a case of ovarian abscess from abscess of the rectum, and recalled a case of genuine ovarian abscess. They are not so very uncommon, nor are they so common. It is not easy to tell what we have when the abscess gets as large as the one mentioned, and be sure that it is an abscess of the ovary. The ovary may be depressed and covered by the abscess.

Dr. Wilson emphasized the importance of putting in a drainage tube or an iodoform tent to facilitate the escape of the discharge. He also used a large quantity of boiled water to clean out the cavity, and left a little to prevent clotting of the blood.

Dr. Welch said it was very proper to use a drainage tube in this case, where there was little chance of getting union by first intention; but if there were a chance of union by primary intention, a drainage tube should not be inserted.

Dr. William B. Canfield, of Baltimore, then read a paper on

OCCUPATION AND DISEASE; WITH SPECIAL REFERENCE TO THE CONNECTION BETWEEN THE INHALATION OF DUST AND PULMONARY DISEASE.

The substance of this paper was to show the dangers of inhaling dust in mills, mines, factories and other closed places where dust is present in excessive amount. This dust is dangerous because of its amount, its poisonous nature, or because it may make a way in the lungs for the invasion of the bacillus tuberculosis and other organisms. He suggested proper ventilation and means to carry off the dust.

Dr. Preston said that the class of cases he had seen had been in stone-cutters. He thought the trouble persisted even after the work stopped. He related a case of inhalation from grinding drugs. It had both a mechanical and poisonous effect. This is important, particularly where manufacturing is going on. We should be servants of the public health. He had seen many cases of lead poisoning occurring in men employed in the same place of business. With much difficulty on his part, and with great reluctance on the part of the owners of the yard, he found that the powder used to polish the stone contained lead, and this was inhaled in polishing, and caused the lead symptoms.

Dr. Welch had seen cases of anthrax from the dust in handling hides and sheep skin. There were intestinal mycoses. He had seen cases of siderosis in Saxony. Dr. Canfield is right in saying that we must consider each kind of dust by itself. The bronchial glands form a filter, but the dust may be carried to other parts of the body. An emphysematous condition tends to let the dust get into the lungs more easily than normal.

Dr. Canfield said he wished to emphasize the

dangers of dust inhalation both on account of the mechanical effect of the dust, and also because the crystalline dust tends to make a way for the entrance of organisms. It was also well to note that cases of pulmonary tuberculosis contracted tended to recovery when the case was removed from the dust.

Dr. J. E. Michael, of Baltimore, read a paper entitled

A CASE ILLUSTRATING THE DIAGNOSIS OF EXTRA-UTERINE PREGNANCY, AND THE DIFFICULTY OF PRODUCING ABORTION.

He related the case of a woman, aged 22, unmarried, who had been treated for suppression of menses, first by drugs, later locally, in view of a muco-purulent discharge from the cervix. Local treatment in applications to the uterine cavity of Churchill's tincture. This was done fifteen times, the applicator having been passed $4\frac{1}{2}$ inches. Dr. Michael diagnosed pregnancy in a sharply anteflexed uterus. Natural labor proved the correctness of the diagnosis.

Dr. Stone, of Washington, in discussing extra-uterine pregnancy, said we should know more of the diagnosis of this condition. He related several cases, and asked where this pregnancy occurred. A rupture through the tube into the broad ligament was called an interstitial pregnancy.

Dr. Welch related a case of a couple who had been married fifteen years without children, when the wife became pregnant. It was supposed to be an ordinary labor, and everything went on well, when she was suddenly taken with pain, collapse, and symptoms of internal hæmorrhage. As she was the wife of a well-known physician, many were called in. She passed some material by the vagina, and some thought it was a case of miscarriage, while others (Thomas and Lusk) said it was extra-uterine pregnancy. As it was easy to see the chorionic villi under the microscope, Dr. Welch, who was at that time just beginning his pathological studies, examined it and found decidual matter, but no chorionic villi, thus proving that it was a case of extra-uterine pregnancy. This shows the practical use of the microscope.

Dr. Stone asked if it was usual for hæmorrhage to occur at the fourth month outside of the sac. After a foetus is two weeks or a month old, he did not know what caused a hæmorrhage, and from what artery it came. There was no rupture of the sac.

Dr. Welch said the rupture of the tubal sac was common. He had never seen such a case where hæmorrhage occurred and there was no rupture.

Dr. Winslow said he had had two cases fifteen years ago. Hæmorrhage is usually the result of rupture of the sac; as the child grows, the tube

is not large enough to receive it, and as it cannot expand, it ruptures. The foetus gets into the peritoneal cavity, and is soon absorbed and is not found. This is well known.

Dr. Michael said he had not expected the discussion to take this turn, but he was very glad of it. He related several cases, and said he thought the clinical aid was generally sufficiently clear without the aid of the microscope.

Dr. Welch said it was interesting to observe what a wide field the discussion on extra uterine pregnancy and hæmatocele took now from what it did fifteen years ago.

Dr. Michael asked if it was always a ruptured pregnancy, or were there other conditions that could produce it.

Dr. Welch thought that a very large percentage of pelvic hæmatoceles were cases of extra-uterine pregnancy.

Dr. A. K. Bond, of Baltimore, then read a paper on

NOTES ON THE USE OF CODEINE.

He had used it in gastric irritation by the mouth and rectum, in the early cough and sleeplessness of the aged and in phthisis. The advantages were there were no gastric disturbances, no constipation, no increase of dose necessary, no habit formed, in fact no interruption in the harmony of the system.

Dr. Canfield said he had used codeine principally in diseases of the respiratory tracts. He had found it better than morphia in some cases, but it was often not powerful enough in the last stages of phthisis, where it made no difference whether a habit was formed or not.

Dr. Stone asked if it produced diaphoresis.

Dr. Bond had not heard of it. He thought the necessity of increasing the dose of morphia was caused by the disordered digestion.

Dr. Edward Anderson said his objections to the use of morphia were the irritation of the skin. It dries up the secretions and causes indigestion, nausea the next day.

Dr. Robert T. Wilson had used codeine for twelve years, and was always much pleased with it.

Dr. Randolph Winslow, of Baltimore, read a paper entitled

A CASE OF ELEPHANTIASIS OF THE SCROTUM.

His father died of meningitis. His mother of phthisis, and he was the last of six children, who had all died of phthisis. About three years ago his scrotum began to enlarge and his penis was almost in it. His virile power was unimpaired. He had never lived in tropical countries. He was given the iodide of potash with no effect. The scrotum was excised and testicles saved. The result was good. This disease is rare in

this country. He could not find the filaria in his blood.

Dr. Welch had seen two cases, and in neither could he find the filaria. He does not think the elephantiasis of Baltimore is parasitic.

Dr. Charles E. Stone, of Rockville, then read a paper on the

EARLY DIAGNOSIS AND OPERATION IN OSTEO-SARCOMA OF THE LOWER BONES.

He spoke of the importance of an early diagnosis and related three cases in his own practice where delay had done great harm, simply because he could not get any consultant to agree to an operation until too late.

This was discussed by Dr. J. W. Chambers of Baltimore.

Dr. Stonestreet related a case of a man 60 years old who broke his femur while sitting on the edge of the bed, just as he was in the act of lifting his feet off the floor.

Dr. Welch did not think that injury was ever the cause of a genuine tumor unless there was a predisposition behind it. He believes in the inheritance of embryonic remnants, and thought the traumatism was only the exciting cause.

Dr. Robert L. Randolph then made a *Report of Fifty Consecutive Operations for Cataract*. This was discussed by Drs. Herbert Harlan, of Baltimore, and Muncaster and E. O. Belty, of Washington.

American Electro-Therapeutic Association.

First Annual Meeting of the Electro-Therapeutic Association, held in Philadelphia, September 24, 25 and 26, 1891.

(Continued from page 934.)

Dr. Robert Newman, New York, read a paper on

ELECTRICITY IN CARCINOMA.

The object of this paper is to give the different ways in which electricity has been used in the treatment of cancer, and to show that cures have been reported which cannot be doubted. Four different methods have been used:

1, Galvanism; 2, electrolysis; 3, galvano-cautery; 4, a combination method, consisting of two of the former.

1. *Galvanism*.—This has been applied externally with pads or sponge electrodes, and (the interrupted current) with needles.

The external application by the galvanic (constant) current with two sponge electrodes to the skin, on or near the tumor, has not met with success, and it seems has only stimulated the cancer cells to greater proliferation, and has thereby hastened the end. Author is not acquainted with a successful case by external application of galvanism.

The second method, by the interrupted galvanic current with needles, deserves more earnest consideration. It was inaugurated recently by Dr. J. Inglis Parsons, of London, who calls it "The arrest of growth in cancer by the interrupted voltaic current."

2. *Treatment by Electrolysis*.—In the treatment of cancer by electricity, electrolysis has been mostly used, and is best known. It differs widely from the former method of galvanism, which, by a strong mechanical action, is expected to destroy the cancer, just as the alternating strong current kills in electrocution. Electrolysis, on the other hand, either destroys, causing decomposition by its chemical action, or causes absorption, according to the strength of the current employed. The art of applying electrolysis successfully consists in using the correct strength of electric current, applying the respective poles in the right place, selecting the size, shape and material of the electrode, and regulating the duration and intervals of sésances.

There are two methods in vogue, one causing destruction, the other absorption. A mild current can effect absorption only; a strength from 5 to 30 milliamperes may be used, and even more, according to work done. A strong current, from 25 and upwards to even 200 milliamperes (and some operators have used even more) will destroy tissues to such a degree that the tumor may slough off as a dead mass. A good rule is to apply the current not stronger than necessary to accomplish the object.

INTERPOLAR ACTION.

It is undecided whether there is an interpolar electrolysis. It is only certain that the decomposition by electrolysis is most at and around the terminus of the poles. From experiments made by the author, it seems that the electrolytic action extends around the needle in a radius of $1\frac{1}{4}$ to $1\frac{1}{2}$ inches.

The conclusions are, that electrolysis can destroy cancer cells, and that electrolysis causes specific decomposition at the pole and within a radius of 1 to $\frac{1}{2}$ inches. Therefore, if needles are inserted in a tumor at a distance of $2\frac{1}{2}$ inches, it may be expected that the electrolysis acts in such a manner that no interstices are left between the needles which will retain the life of cancer cells. According to such conclusions, author has operated principally by two methods. If an absorption by electrolysis was intended, the whole tumor was electrolyzed in sections with needles connected with the negative pole, one, two or more needles in the tumor at a time, while the positive pole was applied as a large pad outside on the cuticle or near the tumor.

The second method is by having needles from both poles, the positive pole (a single needle) in the centre of the tumor; the negative needle or

needles at the circumference or even outside, but near the margin of the tumor in a manner, and at the distance mentioned before. This was applied for the destruction of the diseased mass, to be sloughed off. In the first method by absorption weak currents were used and no anæsthetic, as no pain was caused.

Reports of cures of cancer by electrolysis have been made by Nefel, Beard and Rockwell, Mussey, Gunning, Ernest Wendé and the author. Some photographs of Dr. Wendé's cases were exhibited.

Author commenced, in 1874, the electrolysis treatment in cancer, and has had considerable experience with these maladies. The results varied; some were failures, some patient's life was prolonged, and there were also cures, some patients remaining well without any sign of recurrence of the growth for many years. It would take too much time to relate these cases here in detail; only one case has been published, the specimen being presented to the New York Pathological Society and examined by the Society's committee on microscopy, and other experts. Here are some microscopical slides and drawings belonging to this case, for the inspection of the members of our Association, which has and still can prove that the case was carcinoma beyond any doubt.

The case mentioned under the former chapter of the Parson's method, was treated by the author entirely by electrolysis, and shows what benefit was given thereby even in an entirely hopeless case, and it is not the end, as the patient still lives. A case of epithelioma of the face treated by electrolysis in which no recurrence of the disease occurred in seven years, ought to be counted as cured.

3. *Treatment of Cancer by Galvano-Cautery*, has been done by many; but it seems that Dr. J. Byrne of Brooklyn has had the greatest experience and success. Out of 367 cases thus treated, there was no return of the disease in two to eight years in 153 cases.

4. *Treatment by a Combination*—This consists of an application of two of the former methods, mostly combining the application of the electrolytic and the galvano-caustic effect of the battery in the same case.

Cancer grafting has been recently practiced, and from such experience and reports it may be concluded, that cancer in such cases had been exterminated, and therefore that cancer can be cured.

In what Manner is Electricity Expected to Cure Cancer.

The entire removal of the cancer cells ought to cure cancer, no matter what method is used. Now the question arises, how is this effected by the use of electricity. There are several theories and methods.

1. Strong currents of galvanism are expected to destroy the cancer cells by a mechanical action.

2. A removal of cancerous tumors by extirpation (amputation) is effected by the galvano-cautery.

3. Electrolysis by a mild current acts as an absorption by chemical decomposition.

4. Electrolysis with strong currents acts as a destruction. The strong current will destroy the malignant tumor, leaving a dead mass, which will suppurate and finally slough off, leaving a healthy surface, healing by granulations.

Whatever method is used, it must be done thoroughly and systematically, removing all cancerous cells. Success can only be expected in the earlier stages of the disease, when the malady is local and the malignant mass is concentrated in one small tumor. If the cancer cells are dispersed in different parts of the body, scattered, and the disease has advanced, success cannot be expected.

The Advantage of Electricity Against Other Methods.

1. The facility with which electricity is applied, some methods can be done without an assistant and without an anæsthetic.

2. The operations are free from danger.

3. It causes no shock after the operation.

4. It is easier to get at the whole of the disease in an early stage, than by any other means.

5. It can be used in anatomical dangerous places, beyond the reach of the knife, and the horror of the knife is avoided.

6. It delays the growth, prolongs life and benefits the patient, even if it does not always cure.

7. The patient is not necessarily confined to his bed or house.

8. The operation does not cause pyæmia or septicæmia.

9. There is no danger of hæmorrhage, but it controls hæmorrhage.

10. There is more chance of a cure and better healing after the operation.

11. It always allays pain.

In the foregoing article the details of cases have been omitted; it would have made it too long; it has not been written for the general practitioner.

The object was to report the different electric methods which have been used in the treatment of cancer, before the meeting of experts in electricity, for discussion and improvement.

Dr. Hutchinson:—I am very glad to have listened to Dr. Newman's paper. I have personally known a great many of his cases.

So far as cancer is concerned we have been in touch many years. I have operated on sixteen cases myself. Two are still living. One a case of epithelioma of the lower lip removed fourteen years ago. He has not had any return of it and

is in good health at present. The other is a woman from whom I removed a breast and her two labia majora, and after twelve years she is in good health. These cases are both a matter of record.

I think cancer is curable by galvanism, and I think in some cases where it has become constitutional they are so to some extent; that is, where cancer has become infiltrated through the system by local tumors, the removal of those tumors and taking away of the irritation has resulted in final cure, or at least in great relief.

Dr. Bigelow: In one of the late numbers of a French journal there are some notes upon epithelioma and keloids which have been treated by the same method as that of Dr. Newman. The writer also has under observation now three other cases, and if after the lapse of two or three years he will know whether the lymphatic system has absorbed any of the virus, then we will be able to say whether or not the cases have been cured. We have two cases now which will be published shortly.

Dr. Hayd: Since my name is alluded to in Dr. Newman's paper I gladly arise to say what I know in reference to these cases.

There is no doubt whatever that in the case named the person was cured. He is the official stenographer of the court, and had had it several years. He had been treated by several methods. The growth was twice removed by the knife and twice he went to so-called cancer specialists and had some caustic applied; in all probability a preparation of arsenic. He was also treated with cod-liver oil applied locally, as it was thought by some to be a case of lupus. I saw the man last week, who came to me desiring to renew an insurance policy, and I am pleased to be able to tell you there were no nodules or tubercles and no ulceration. The sore, which had been unsightly two years ago, has now healed, and in place of an ugly cicatrix he has a clear face and scarcely any scar to be seen.

Dr. Wend has done a great deal of work in this direction, and his reports can be accepted as from a well-qualified man fully competent to express an opinion upon this subject. He is professor of the diseases of the skin in the Buffalo Medical College, and whatever he writes is written with honesty of word and intention, and these cases I can verify, as I have seen them. None of you, if you saw this case now, would have any idea that he had had any malignant ulceration; it is not noticeable.

Dr. Walling: I have had a little experience in these cancer growths. A case in which Dr. Massey kindly assisted me in Parson's method, and which was referred to by Professor Goodman, the patient had lost his hand from the growth some years ago, and now the growth had appeared in the left axilla. The whole left side

was involved. It was of a dark purplish color and he was suffering a very great deal of pain, and I advised him to have the arm taken off at the shoulder, but he preferred to have the electrical treatment. I used Parson's method and 600 milliampères with repeated alternations of current. On the back side of the arm was an ulcer the size of a walnut, which had broken out from degeneration. I thrust eight needles—four platinum and four steel—into the growth. Inadvertently the current was run up to one ampère and the needles dropped out. The consequence was we had a deep slough. The tissue under the positive needles was almost like cartilage and I was afraid I would not be able to heal it up, and that it would degenerate below and I would have a bad case; however, I took the negative carbon and acted upon the apparently cartilaginous tissue and cleaned it all out from time to time, and it healed up entirely notwithstanding the continued irritation of the parts, making application of the positive current until it was all cleaned up, and although the result of this operation did not succeed as we had hoped, it so checked the growth that I repeated the operation up to fifty milliampères with the result of checking the growth for a long time, but as it was deeply seated in the axilla, we could not reach it on account of the larger vessels. The ulcer was treated with carbon electrodes passing deeply in and keeping it clean, and syringing it with an antiseptic, as well as keeping it covered with boracic acid and cotton; finally it ulcerated through a large artery and the man died.

Another case which came under my care in the Medico-Chirurgical Hospital was a case of epithelioma of the face, and this was cleaned out by two operations. It was acted upon by the negative needles, using fifteen milliampères without an anæsthetic, and by acting on the surface with the negative carbon with rather deep action. The surface healed over in about three weeks' time. I have not seen the case for six months, but I believe those things can be cured if taken in time.

Dr. Morton: I do not like to keep my seat without thanking the author for his excellent handling of the subject. I have had no experience whatever in treating cancer with electricity, but I recall that his paper is a resumé of the former operations, and the methods he outlined we leave out of view, which I imagine he views as an amputation procedure. It opens up such a large volume of fact and speculation that we cannot go into it; but it involves this treatment of cancer and cancer growth by the direct action of the needle, and involves the electrical treatment. I hardly see how you can say that the galvanocaustic treatment is not purely electrical as well as a chemical treatment. The very fact that you use a sufficient current to produce an electrolytic

product at the point of the needle is the best evidence in the world why you are using sufficient current to produce those profounder effects which you would like to have gotten with the galvanocaustic treatment. When you use the galvanocaustic and galvano cautery treatment you cannot separate them.

The peculiar part of the whole thing is, as I understand from the reader's paper, that electric energy has a peculiar selective power to act upon the cancer cells and not upon the healthy cells, otherwise I cannot see how a distinction can be drawn between the galvanic treatment and the knife. If the galvanic treatment has this selective capacity, that is the point that should be made clear. I think I should like to have heard a little more discussion about the varieties of cancer. It seems to me that a great many of the results are in epithelioma, and I think that dermatologists claim good results from other treatments than electricity. Dr. Fox showed me good results from other treatments.

Dr. Massey: I must join Dr. Morton in commending the paper as not only careful, but very moderate in its statements, and we should be careful of promise in such desperate diseases. We want to get at the facts in an exact manner when we have to deal with one of the worst scourges of the human race, and one, so far, which has been apparently entirely resistant to medical treatment.

It was only yesterday, at a meeting of the American Gynecological Society, that a discussion occurred on hysterectomy for carcinoma of the uterus, and I was struck with the failure of surgery also to accomplish striking results. Recurrences seem to be alluded to often in speaking of cases, unless they were distinctly minute in their seat at the time of operation, that it must be regarded as almost an entire failure. The question of the cautery does not come into consideration here, it being merely a thermic knife, and thermic destruction of tissue. To my mind the other question, of a possible value of electricity in killing the cancer germs themselves, is of far greater importance. Allusion has been made to the question of selective affinity to cancer cells. I scarcely think that is a good way to put it, to describe what I regard as a fact.

The cancer cell is a highly liquid infiltration of more solid tissue—I now allude to epithelioma—and in addition to that fact, presents another reason for lessened resistance in that lowly organized tissue. I think it can be well demonstrated that more current will traverse a cancer than a non-cancerous tissue. Then again, cancerous tissue is possessed of low vitality, and probably therein lies the greatest power we have to electrically kill it. Surrounded as it is by more highly organized tissue, it cannot resist the onset of a strong current or strong chemical action, and

hence it may be amenable. If amenable, how much better is such a practice for good, for the cancerous infiltration is followed back into its habitat, or more correctly stated, back through the lymphatic tracks that lead into the more healthy tissue.

My own experience in this subject has been mainly with epithelioma of the cervix. I have used methods different from any mentioned. I am not sure whether they are entirely novel. It is simply a direct application of a strong current on a limited surface, of the carbon positive pole directly to the diseased tissue. In that way, the parts being free from excessive sensation, I accomplish the ready destruction of cancerous tissue. You can at once accomplish the immediate cessation of bleeding which annoys and weakens the patient. I have in one application, with less than 100 milliamperes, arrested a hæmorrhage which had lasted a year, and the hæmorrhages have never recurred. It arrests hæmorrhage quickly, and the cancerous tissue will afterwards come away, under the influence of antiseptic douches, in white crumbs, and leave a clear, hard excavation where the cancer had been. In one old case in which there was not sufficient treatment, there was no question about the prevalence of cancer in other parts of the body. Excavation finally resulted where the cancer had been which would admit two or three fingers, which became lined with a healthy material. This was cured with the idea of seeing if any cancer cells were left, and Dr. Crozier Griffith, who is one of our best microscopists, decided there was not. This person finally died of cancer of the liver. These cases have been unfortunate in being treated at a period of the disease when they could not be benefited, but I am sure that if the cases are taken early, cure can be accomplished.

I assisted Dr. Walling, as he relates, in using the Inglis-Parsons method in the case related by him, and I think we used it quite strictly, but the case, as he has said, was most unfavorable, as it had reached the bones before we treated it, but it suffices to show the value of the Parsons method. The accidental use of 1,000 milliamperes was on account of a too close apposition of the needles.

Dr. Morton: Before taking my seat, I would like to ask the author of the paper as to whether the effect he obtained was due to actual electrolytic decomposition by the chemical products of the electrical current; in other words, how much is due to electrolysis and how much to the caustic effect.

Dr. Blackwood: The remark just made, that the electrical current has a greater effect on cancerous tissue than upon the normal, is, I think, correct. In a case which I saw some time ago, where a surgeon attempted to persuade the patient to go under an operation, but which she at

that time refused, and upon whom I was permitted to use the electric current for several applications, the uterus was bound down and she was very uncomfortable, and it was difficult to get the needles in properly. I noticed that the action was very destructive on the cancerous tissue and not upon the other tissue. But finally the surgeon obtained more influence upon her than I could bring to bear, operated upon her and buried her.

Dr. Waite: I saw one case of Dr. Wende. He used after his ordinary treatment the faradic current, which he thought prevented the case from going back, and he usually makes the application fifteen minutes after the treatment with the needle.

Dr. Newman: In summing up, the only thing which I have to do is to answer the question of Dr. Morton.

It is true I never thought that the galvanic cautery was strictly a chemical action, but at the same time I think it applies to electricity, so that I gave it a distinct division in the treatment. While it is in the line of surgical action, I think the electricity has something to do with it, but how much of either it is impossible for me to say.

The other question, to say how much in this treatment is due to electricity *per se*, or electrolysis, I do not feel competent to say—I do not feel competent to speak, as I am biased, as I am enthusiastic about it. I am known to attribute the effect to chemical decomposition, and I believe that the principal action by which we do this, or get these effects, in the cure of cancer, is by electrolysis and its chemical decomposition. This chemical decomposition may be of a twofold character; the weaker is an absorbent, and the stronger a destructive. It is certain that the electric action has a good effect. I have on purpose not given any opinion of my own.

I have given the method of Dr. Parsons, which I believe in some cases to be impossible to use. Imagine the application of 600 milliamperes on the left side near the par-vagus, what would become of the patient? I do not feel competent to express an opinion as to this method, either praising or condemning it, without more experience.

Electricity has certainly an action. Some think it is a plaything, but it has killed many patients.

To go further and deeper into the subject as suggested by Dr. Morton, I feel incompetent to do. The material on hand was so overwhelming when I commenced to write my paper, that I had considerable difficulty to bring my paper within compass, and it is much larger now than I should have made it, and I tender to you all my sincere thanks for your careful consideration.

(To be continued.)

NEW YORK ACADEMY OF MEDICINE.

Section on Orthopædic Surgery.

Stated Meeting, November 20th, 1891.

SAMUEL KETCH, M.D., CHAIRMAN.

A CONVENIENT DRESSING FOR CASES OF TORTICOLLIS AFTER OPERATION.

Dr. R. H. Sayre presented a boy upon whom he had operated twelve days before, for the relief of torticollis. The case illustrated the form of dressing which he had found very useful after such operations. It consists of a plaster of Paris jacket and a jury-mast, the upper part of which has a fan-shaped expansion fitting the occiput. After a thorough subcutaneous sub-division of the sternal and clavicular attachments of the muscle, the boy was allowed to come out of the ether, and then a tightly fitting foot-ball cap was pulled down over the ears and covered with a plaster bandage, which also included the expanded portion of the jury-mast. In applying this dressing, care was taken to place the head in the normal position. The mechanical appliances usually employed for the after-treatment of these cases is difficult and tedious to make, and must be made for each patient, and even then are hard to keep in position.

Dr. A. M. Phelps considered this the most efficient dressing of its kind which he had seen.

Dr. N. M. Shaffer did not share the opinion that the mechanical appliances ordinarily employed were complex, and difficult of application; on the contrary, he thought they possessed a distinct advantage over this fixed plaster dressing, as they allowed of frequent but slight changes of position, and a gradual restoration to the normal position. The case just presented, did not show a complete correction of the deformity. In two recent cases of club-foot in which he had endeavored to fully correct the deformity at once, too long a tendon was the result.

Dr. L. A. Sayre said that he had employed this dressing for the last ten years to the exclusion of all others, and had found it more efficient than any he had previously tried. The principle of practice laid down by the previous speaker, he considered erroneous; immediate and full correction of the deformity was much better than tormenting the patient at short intervals by frequent stretchings of partly adherent tendons. If proper judgment were exercised, the tendon should not be too long.

Dr. Phelps said he wished to heartily endorse the principle laid down by Dr. Sayre. The English method of gradually reducing the deformity by stretching, was, in his opinion, a fruitful source of non-union of tendons, and of their adhering to their sheaths. He had never had a single case of non-union of tendons, and he always divided them thoroughly and super-corrected the deformity at once.

Dr. R. H. Sayre, in closing the discussion, said that in certain cases of wry-neck where stretching was preferable to tenotomy, the Archimedean screw and other mechanical appliances usually employed, were very effective, but if the tissue be contracted, and hence required tenotomy, he thought the dressings he had just shown would be found to give more perfect fixation of the head. Immediately after the tenotomy, a certain amount of material is poured out between the ends of the divided tendon, and a large gap can be filled up as easily as a small one. As the amount of this exudation neither increases or diminishes after the first effusion, it follows that if the position were not fully corrected at the time of the operation, subsequent stretching can only produce elongation of the tendon at the expense of its diameter.

Dr. Halsted Myers presented a case of

LUMBAR POTT'S DISEASE,

with a very large abscess occupying the right side of the abdomen from the ribs to the pelvic brim, extending nearly to the median line in front.

The boy's general health was excellent. He was fat and ruddy. His bowels were regular. There was no albumen or casts in his urine. There was no enlargement of the liver. His temperature varied between 98° and 99° F.

The patient was presented to illustrate a not small class of cases, and to prove that very large cold abscesses can and do exist without causing any disturbance of the general health.

Dr. Thomas H. Manley thought the lesson to be learned from such a case, was that extreme conservatism should be exercised in the treatment of abscesses where they do not give rise to pronounced constitutional symptoms.

The Chairman was of the opinion that one of the most important lessons which the orthopaedic surgeons had impressed upon the general surgeons, was that many cases of abscess disappear under proper mechanical and constitutional treatment. He would even go further, and say that many abscesses were prevented by such treatment, and that as these methods more nearly approached perfection, abscesses would be less frequent complications of Pott's disease. While admitting that at times it was very difficult to decide as to the advisability of operative interference, he was personally of the opinion that in cases of joint or spinal disease, there was less risk from the non-operative treatment, for the reason that pus in a closed cavity is much less dangerous than after the cavity has been exposed to the air.

Dr. Phelps said that in the case just presented, the abscess was probably really a cavity filled with tubercular material, and free from the germs of suppuration; but while such "cold abscesses"

might remain for a long time without doing any harm, they were liable sooner or later to become infected with pyogenic germs, and when this occurred, "burrowing" would begin, and the patient would exhibit all the usual symptoms of sepsis. As there was no means of telling when such infection would occur, he thought it wiser to operate on all of these cases. He felt perfectly confident that he could operate on all such cases without any danger from sepsis, and he had never seen any deaths attributable to such operation in his hands.

Dr. Shaffer said that this theory sounded very nicely, but a large hospital experience extending over a period of twenty-eight years, during which time he had tried various methods of treating these abscesses, had taught him to regard them as of no great importance, and he would not consent to opening these abscesses unless there were severe or prolonged constitutional symptoms due to the abscess. If we were wise enough to let these abscesses alone, the patients would usually do better than if they were opened.

Dr. R. H. Sayre said that his experience with these abscesses had been quite different from that of the previous speaker, and he looked upon them as representing a serious phase of the disease. Where the abscess cavity did not admit of safe and thorough evacuation of its contents, so that healing might proceed uninterruptedly, it was better not to operate, unless there was serious constitutional disturbance. Letting all cases of abscess alone was as harmful practice as opening every abscess which presented itself.

A CASE OF TALIPES EQUINO-VARUS SHOWING THE IMPROVED LATERAL TRACTION APPARATUS.

Dr. N. M. Shaffer said that the development of this traction apparatus had been attended by much experimentation and annoyance, and during this period, there had been naturally a number of failures. A large number of cases of pure equinus which would ordinarily be condemned to tenotomy, could undoubtedly be cured in this way, but in the more complex deformity, known as equino-varus, the mechanical conditions were much more intricate. The first two cases which he presented were intended to show the good results which had been obtained without the latest improvement, and the third one, to show the improved apparatus applied to the patient, as well as to exhibit the result of three month's treatment. In the older instrument, there were three movements, viz.: 1. One which put the foot in any position as regards the equinus; 2, one which threw the foot outwards as far as desired, and locked it there; and 3, one which drew the foot around into a valgus position. It had been found in cases which had been treated

by this apparatus, and were apparently cured, that there was inward rotation of the whole foot on a vertical axis, and the object of this latest improvement was to correct this defect. It consists in extending the apparatus up to a pelvic band, and introducing a fourth movement, by which the whole foot is turned on the vertical axis.

The girl whom he exhibited with this apparatus, had been admitted to the Orthopædic Hospital on August 27th, with such a severe type of double equino-varus, that he thought many would have advised operation. The four movements which he had described had been made "up to the point of toleration," and repeated many times a day. They were executed in the following order: 1. Bringing the foot up while the heel is held down; 2, throwing the foot outward and keeping it there; 3, turning the whole foot on a vertical axis; and 4, throwing the foot into a valgus position. While the third movement is being made, it is noticeable that the patella does not move. The results he had obtained with this new apparatus were remarkably quick and satisfactory.

A STUDY OF ONE OF THE ETIOLOGICAL FACTORS OF LATERAL CURVATURE OF THE SPINE.

Dr. Charles L. Scudder, of Boston, presented the results of an investigation into the seating of 3,500 school girls, with especial reference to the effect of poor seating upon spinal deformity.

Lateral curvature of the spine is in all probability due to several factors: 1, the superincumbent weight of the body falling upon a spine weakened either in bone, muscle, or ligament; and 2, held persistently out of the median antero-posterior plane of the body.

Dr. Scudder made a careful examination of the seating in schools, and found that faulty positions, one of the elements of the third etiological factor, are certainly induced because of the lack of adaption of seat to pupil and pupil to seat. How much of a factor in causing lateral curvature poor seating is, it is impossible to say, but that it plays an important part there can no longer be any doubt.

The author suggested that the present seating arrangements of schools be used to better purpose than hitherto, by arranging scholars more carefully in the room, and having careful supervision exercised by those in charge.

He then described the development of the adoption in the Boston Public Schools of the Swedish Gymnastic system, and regarded it as of highest importance as a measure likely to be somewhat preventive of spinal curvature induced by poor attitudes in sitting. This is to be brought about by no specialized gymnastics, but by general, central movements which shall tend to develop the whole child along the lines of his natural muscular development.

Dr. L. A. Sayre said that if proper attention were paid to the physical training of girls, there would be few cases of lateral curvature.

Dr. V. P. Gibney said that the paper reminded him of some observations he had made at one time in our public schools. In passing through the schools he had been struck with the frequent changes of position of the pupils, and he had concluded that faulty attitudes were not so potent a factor in this condition as he had previously imagined. He was, however, willing to admit that it was quite possible that weak children having once assumed a comfortable attitude, would be likely to maintain it long enough to be injured thereby.

Dr. Ramon Guiteras agreed with the author as to the great importance of the Swedish gymnastics in the training the bodies of young children. As to the matter of desks, he was happy to say that school desks and chairs had recently been invented by E. E. Hicks, a student of the University, which could readily be adapted to any height.

Dr. H. L. Taylor said that the author had shown indisputably the necessity for competent medical supervision of our public schools. As lateral curvature occurs rather more frequently among the children of the well-to do class, who as a rule, attend private schools where the seating of the children usually receives more careful consideration than in the public schools, and as this deformity also sometimes develops among children who have been entirely educated at home, he was not willing to admit that faulty school attitudes were very potent in producing the deformity in question. They undoubtedly do children harm, with the production of lateral curvature. The instinct of young children is to keep in motion, and one of the great faults in our system of education is the absence of frequent short recesses. A recess of five minutes between each recitation, especially if utilized for gymnastic exercises, would prove very beneficial, and he hoped the paper would receive that wide and thoughtful attention which would lead to the introduction of rational physical culture into our school life.

The Chairman said that his own impression was that no habit in itself, no matter how long continued, could produce an idiopathic rotary lateral curvature of the spine. Some years ago, he had written upon the etiology of this condition, especially in young children, and had called attention then to the fact that the curvature was present before the children assumed these faulty positions, or in other words, that the position was the result of the curvature, and not the cause. He was willing to admit, however, that a *curve* of the spine could be produced by a long continued bad position.

Dr. Scudder, in closing the discussion, said

that he recognized that among the many factors which entered into the causation of lateral curvature, three important ones were, the superincumbent weight of the body upon the spine, 1, weakened by a diseased condition of the bone, *e.g.*, rickets; 2, weakness of the muscles (not yet demonstrated); and 3, weakness of the ligaments. Although it was not yet known whether one or all are present in any given case, it was known that the superincumbent weight of the body falling upon a spine which is kept in the median plane of the body, causes only an antero-posterior curve. This was known both by demonstrations on the cadaver, and by observations on the living subject. But when the spine deviates from this median plane, a certain amount of lateral curvature results. His paper embodied a study of the effect of faulty positions on the body, and did not assert that faulty positions in themselves caused lateral curvature.

THE ANATOMY AND MECHANISM OF THE FOOT
WITH SPECIAL REFERENCE TO TALIPES;
AND THE EXHIBITION OF A SHOE
FOR CLUB-FOOT.

A paper with this title was read by Dr. James E. Kelly. He indicated the relation of the progression of terrestrial animals to cyclical motion, likening that of bipeds to a unicycle in rapid motion, and a lateral bicycle, such as the "Otto," in slow motion, while a quadruped resembled an ordinary bicycle in rapid, and a quadricycle in slow motion. He indicated the relation of the pelvis to the "hub" or nave of a wheel, the thighs and legs to the spokes, and the feet to the rim or tire. Great economy was claimed in weight, space, labor, and nutrition by the substitution for the entire wheel, of two spokes, and the corresponding tire segments of feet which alternately assumed the functions of the numerous portions, each oscillating as a complex pendulum, and describing the brachistochrone or curve of the most rapid descent. He exhibited a model which reproduced the movements very accurately.

Dr. Kelly controverted the accepted description of the foot as consisting of antero-posterior and transverse arches, and demonstrated the fact that the two feet placed together constitute a dome or cupola, the entire margins of which rested on the ground, and consequently, one foot might be more properly termed a semi-dome. He proposed an original explanation of the advantages we derive from the outer toes being the shorter, in the fact that when the semi-dome revolved on its margin from the posterior to the inner anterior portion corresponding to the great toe, while the body moved forward, the consequence was that the ankle was bent outwards and placed in the most favorable position for clearing the inner side of the opposite foot when swinging forward to assume its anterior position.

He dwelt on the nomenclature of talipes, and suggested the term "talipes ankylosis," for that form described by Dr. Schaffer as "non-deforming talipes." He entered into the mechanism of talipes more especially with regard to the type than the particular form, and reduced the factors of deformity to extension, luxation, and torsion, and indicated their participation and isolation in various deformities. He also spoke of the influences which produced the deformities, as modelling pressure and adaptive growth, and indicated that mechanical treatment was limited by the extent to which the same factor could be utilized in rectification. The question of operation was to be decided by the same standard. He exhibited some diagrams which demonstrated the theoretical advantages of the removal of the wedge-shaped pieces of bone, with the careful avoidance of the articular surfaces, from the calcaneum, the internal cuneiform, and the tibia in talipes valgus, and the comparatively great rectification which could be obtained by the excision of very limited wedges. The author dwelt upon the ease and safety with which all portions of the tarsus could be approached through incisions along the margins of the foot, owing to the stratification of the structures forming the sole, and advocated the section of the plantar ligaments by an oblique incision parallel to the tendon of the *deroneus longus* from the outer side, and the freeing of the cuboid bone by a curved incision from the inner margin of the foot.

Dr. Kelly also exhibited an apparatus which he had invented in 1881, and first demonstrated before the Massachusetts Medical Society in 1884 or 1885, in a discussion on a paper read by Dr. Edward H. Bradford on "New and Original Methods of Treatment of Club-Foot." The appliance consists of a boot with a metal sole-plate, a pair of strong drawers with a "box knee-cap," and a number of slight elastic bands. The plate resembled a segment of a saucer from which the steadying rim had been removed. The boot was placed on the flat central portion and had a number of holes along the elevated margin from which the elastic bands passed to the lower band of the box knee-cap. The apparatus utilized the weight of the patient's body as the rectifying force, as at each step a part of the curved portion of the plate coming in contact with the ground, rolled it over until it reached the only part that afforded stability, namely, that upon which the foot rested, and consequently the member was forced into the most advantageous position. The elastic bands were added for the two-fold object of maintaining, during repose, the benefits derived from locomotion, and of exercising lateral torsion on the foot by an easy arrangement of the bands with regard to the plate and the knee-cap. He expressed the belief that the shoe in its present shape would be useful in

the less aggravated forms of talipes equinus and varus, and as an adjunct in the treatment of the more severe examples.

Southern Surgical and Gynecological Association.

Fourth Annual Meeting, held in Richmond, Va., November 10, 11 and 12, 1891.

(Concluded from page 936.)

THIRD DAY—AFTERNOON SESSION.

Dr. Paul B. Barringer, of Richmond, Va., read a paper on *Venomous Serpents of the United States and the Treatment of Wounds Inflicted by them*.

Dr. Christopher Tompkins, of Richmond, Va., followed with a paper entitled

A CASE OF INDUCED ABORTION FOR RELIEF OF NAUSEA AND VOMITING, WITH REMARKS.

On August 1, 1885, he was called to see Mrs. J., aged 24, and, as nearly as could be ascertained, three and a half months pregnant with her first child. Patient was born in the mountainous part of Virginia; she had an active outdoor life and grew up to be a woman of good height and of round full figure. January 14, 1884, she was married.

While in the city of New Orleans, in stepping from the platform of a car, she sprained her ankle. This, although treated immediately by a physician of that place and subsequently in this city, caused her great suffering. Finally, refusing to yield to the usual treatment, the part was put in a plaster cast; she went about on crutches, and after many months recovered. In the meantime she became pregnant and from the first was attacked with nausea and vomiting. Mild in the beginning, it gradually increased in gravity, till she sent for him on the 1st of August, 1885.

Her husband stated that she had had fever for two weeks. He found her in bed and learned that she had been there for days; her figure not robust, and her face thin and attenuated. What little she had eaten in the past ten days or two weeks had been apparently rejected, her temperature one degree above normal; tongue foul; sordes on the teeth, and the breath of a sour and bilious odor. The pulse was fairly good, considering her condition. Even the mention of food was distressing to her, and the sound of the dinner bell, though far off from her, caused such distress that its ringing was discontinued by the family. The bowels had throughout her pregnancy been constipated, only moving once in two or three days. Although continuously retching, very little or no blood had been seen in the material vomited, except on two occasions, and then not a great deal, and such as there was

was of a florid, scarlet color. No medicine had been given and no treatment taken, except the occasional use of lime water, which she said "did no good."

The patient did not improve up to August the 7th, when Dr. Tomkins, thinking the case one of the greatest gravity, and that the question of abortion could no longer be deferred, invited Drs. J. B. McCaw and Aaron Jeffery to meet him in the afternoon in consultation. All agreed that abortion must be produced, in order to give the patient a last chance for her life, which was done.

REMARKS.—The case is reported principally because it was an unsuccessful one, and because he wished to disabuse the minds of those who are not experienced in such operations of the notion, commonly believed, and often expressed, that the induction of abortion for the nausea and vomiting of pregnancy is in skillful hands an undertaking devoid of danger and necessarily attended by success. In this case, he is of the opinion that death was the result of the protracted ability and enfeebled constitution, due to her long confinement and suffering: First, from the injury to her ankle, from which she had not recovered, when she became pregnant and was attacked by nausea and vomiting, this last continuing till her death. Under such circumstances the outlook was indeed very unfavorable, for to the shock of operation and depression incident to the use of chloroform, there was added fever and protracted prostration, both from injury to the ankle and from want of nutrition, the result of the long existing nausea and vomiting. He had before and since operated on women for the nausea and vomiting of pregnancy and with success, whose apparent condition was much worse than that described in the above case, but without the history of a previous injury or disease.

The prognosis, always unfavorable, ought, when the case is so complicated, to be of the most guarded kind. The practitioner should not, however, hold his hands on this account, for the operation affords the poor sufferer the only opportunity of relief. The author uses metal dilators instead of tents, and completes the operation at one sitting. He is likewise convinced that the least possible chloroform used, the better the result.

Dr. W. E. B. Davis, of Birmingham, Ala., presented a paper entitled

TREATMENT OF GALL STONES, WITH CASES.

He said: "The treatment during the attacks consists in hypodermics of morphine and atropine, with the use of ether and chloroform until the other remedies have had time to take effect. It is usually soothing to place the patient in a hot bath; and large draughts of hot water will relieve the distressing nausea.

After gall-stones have formed, experience does not warrant us in placing confidence in medical treatment for their cure. The sweet oil draughts, as has been abundantly shown, only become saponified, and give rise to stone like masses. Turpentine, chloroform and wild yam are not curative.

Perhaps something may yet be found that, when injected into the bladder, will dissolve the stones. This is especially desirable for stones located in the ducts. It would seem that medical treatment would prevent their formation; but, so far, there is no very good evidence to show that any medicine has this effect.

A stone in the gall bladder produces such a condition as to favor the formation of other stones; and after an operation for the removal of the stone and the relief of the local condition, we have no return of the disease except in a very small per cent. of cases. This is so in those cases in which stones had been forming rapidly before the operation, and would go far to show the importance of the local causes of the disease. Then, in addition to general tonics, iron, phosphate of soda, mineral waters, etc., our dependence must be placed on operative procedures.

In some cases it may be difficult or even impossible to make a diagnosis of gall stones, but it has been said very correctly that the mistake is much oftener made in calling gall-stones something else than of calling something else gall-stones. Paroxysms of epigastric pain, with tenderness over the lower hepatic region, accompanied with bile in the urine, and followed by clay colored stools, and sometimes the passage of stones, are the symptoms on which dependence must be placed. The shoulder pain is rarely present, and jaundice is most frequently absent. It is only when there is obstruction in the hepatic or common duct that this symptom is to be expected; and often the obstruction is so evanescent as not to give rise to sufficient obstruction to produce jaundice.

When there are frequent attacks of biliary colic, it is best to operate and give the patient the benefit of the exploration, and avoid the dangers of a peritonitis. It is not conservatism to delay operation, where there are obstructive symptoms, until the liver has become involved and the patient's blood poisoned. He had seen a number of these neglected cases in which an operation could offer no chance whatever. He reported a case of death from peritonitis following repeated attacks of biliary colic, where there was sufficient warning to save the patient, but her physician would not advise an operation. In some cases, however, there are no symptoms to indicate the presence of a stone, until peritonitis has resulted from ulceration thus induced. During the past month he had operated on such a case at Ashville, Ala., for Dr. D. E. Cason. The patient

was a woman 74 years of age, and had never experienced any symptoms of gall-stones.

He recommends cholecystotomy, and opens the bladder and sutures it to the parietes at one operation. He reported a case in which he removed 51 gall-stones from the bladder, one of them being impacted in the cystic duct, and the patient made a perfect recovery.

Cholecystectomy, the removal of the gall bladder, should never be an operation of selection, and only resorted to when cholecystotomy is not possible. Do not stitch the bladder to the parietes and wait for adhesions before opening the viscus, as it is necessary for it to be opened and emptied before the abdominal wound is closed, in order to recognize conditions which will require manipulations within the abdomen as well as within the bladder. Stones impacted in the ducts must be dislodged and pushed into the bladder or duodenum. It may be necessary to break them up with a needle before this is possible. In some cases the duct should be incised and sutured. Where the obstruction in the common duct can not be relieved, cholecysto-enterostomy should be resorted to.

The following officers were elected:

President—Dr. J. McFadden Gaston, Atlanta, Ga.

First Vice-President—Dr. Cornelius Kollock, Cheraw, S. C.

Second Vice-President—Dr. Geo. Ben Johnston, Richmond, Va.

Secretary—Dr. W. E. B. Davis, Birmingham, Ala.

Place of next meeting, Louisville, Kentucky, second Tuesday in November, 1892.

Chairman of Committee of Arrangements—Dr. L. S. McMurtry, Louisville, Ky.

MICROÖRGANISMS IN THE NORMAL HUMAN URETHRA (*Centralblatt für Chirurgie*, No. 44).—Messrs. E. Petit and M. Wasserman communicate the results they have obtained by exact microscopical and bacteriological examination of the human urethra. The observations were made upon four of their colleagues who had never suffered from any form of urethral affection. The observers have discovered five varieties of micrococcus, six of bacillus, two of sarcina, and two of torula cerevisiæ, of which they describe the microscopical and bacteriological peculiarities. Both authors comprehend their principal results in the following propositions:

1. The normal urethra always contains different varieties of microörganisms.

2. The same varieties are never found in different urethræ.

3. In one and the same individual a difference is found in the varieties taken from the anterior and posterior portions of the urethra.

4. None of the microörganisms discovered are under ordinary circumstances pathogenic.

5. The greater number, however, decompose the urine.

6. The pseudo gonococcus of Lustgarten and Manna-berg was never found.

It is not possible by the most careful and elaborate antiseptic washing of the urethra to obtain a perfect condition of antisepsis.—*Provincial Medical Journal*.

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SATURDAY, DECEMBER 19, 1891.

DIET IN TYPHOID FEVER.

The dictum of "liquid food in typhoid" has resulted in the use of an exclusive milk diet by many physicians. So much so is this the case, that we think we may truthfully say that the orthodox diet in typhoid, as recognized by the profession as a whole, is one exclusively of milk. The advantages resulting from the use of the milk diet have been noticeably great, and it is customary to ascribe these benefits to the bland character of the food. The liquid character of the milk is particularly insisted upon and it is assumed that solid food would be detrimental because of its solidity.

It seems to be opportune to call into question this mechanical explanation of the results obtained with a milk diet. The diminished risk to perforation which it may afford is insufficient; its lack of irritation upon an inflamed bowel, is too indefinite.

In the first place, milk is only apparently a liquid food. Its coagulation into great masses in the stomach, soon after its ingestion, makes it a solid food, without the advantage of subdivision, which other solid foods would have. Moreover, the use of solid foods in ulcerative conditions of the bowels, other than typhoid, is not held to be dangerous. In dysentery milk is not

as well borne as animal broths, and farinaceous foods. Some authorities speak of the disadvantages of milk in the diarrhoea of infancy. Yet, nevertheless, in typhoid fever it has proven the best diet thus far used. If the true reason for its utility be known, the limited milk diet may be extended along proper lines, much to the benefit of the patient. The mechanical reason for its utility is eminently insufficient and unsatisfactory. The reason must therefore be sought in the chemical conditions present.

The stools voided by the typhoid patient may possibly be the result of the action of the microbic cause of the disease in the blood, but it is far more likely that the conditions within the alimentary canal itself, have much to do with their character. The results reported from the use of intestinal antiseptics, by many observers, particularly the sulpho-carbolates as used by WAUGH, indicate strongly that much of the fever, and many of the symptoms produced in typhoid are directly due to the fermentative conditions in the bowel itself. Several years ago RACHFORD¹ made a series of observations on rabbits, designed to elucidate these points. He grew pure cultures of typhoid bacilli, in different culture media, viz.: peptonized milk, peptonized beef, peptonized brain, and bouillon and beef peptonoids. These cultures were introduced into the stomachs of the rabbits.

The rabbits which were fed the beef peptonoid cultures exhibited very pronounced brain symptoms, with elevation of temperature. The brain and beef cultures produced the same effects without elevation of temperature, while the milk cultures produced the mildest type of the affection. RACHFORD'S experiments fully justify his conclusions, viz.: "The physiological and poisonous properties of the ptomaines formed by this bacillus [KOCH-EBERTH] will depend in great part on the character of the food material in which it is growing," and "milk is the best diet in typhoid fever, since the ptomaines produced in it do not cause either fever or nervous symptoms."

Now, then, the true reason for the value of milk in typhoid being known, some clue to the means of supplementing it in the right direction is given. Milk is not a complete nutrient for the adult as it is relatively deficient in carbohydrates, and in febrile processes especially are car-

¹ Medical News, Phila., Vol. LV, p. 453.

bohydrates needed. The poisons which RACHFORD'S experiments show to be active, are all derived from animal food. Poisons capable of producing nervous symptoms or fever can not be formed from carbohydrates, so that objection to these articles of food on this score can not be urged. They might produce flatulence and increase the tympanites. The mechanical objection to carbohydrates, such as bread, rice, and potatoes is surely exaggerated. The incomplete nutritive value of the diet to which typhoid patients are subjected certainly must have a marked effect in prolonging the period of convalescence, and no doubt also reduces the strength of the patients during the attack to such a degree as to permit a fatal issue which a more complete nutrition would have prevented. In the absence of figures we may be allowed to believe that more deaths would result from this incomplete nutrition, than could possibly happen from perforation under a more generous diet.

Again, the occurrence of severe nervous symptoms may even indicate the complete withholding of milk temporarily, for the purpose of assisting in bridging over a serious episode in the course of the disease.

WHAT IS DIPHTHERIA?

By not a few clinicians the dread term diphtheria is limited to cases presenting only the most marked features of the disease. Severe putrid throat, with false membrane and much swelling, general involvement of the neighboring glands, and severe septic symptoms, are for these men, necessary, to constitute a case of diphtheria. In consequence, particularly if they practice outside of the larger cities, where the disease is always more prevalent, they find diphtheria a rare disease.

But diphtheria, like all the infectious diseases, can and does possess a wide range of severity. In its mildest types, the false membrane is usually limited to the tonsils, and in some instances it cannot be certainly distinguished from follicular tonsillitis. Nevertheless these cases are diphtheria, and are quite as capable as more severe cases of becoming foci of infection. The physician in attendance upon such cases is bound to take cognizance of the possibility of infection, that he may take proper precautions if he goes

into the lying-in room, or makes a surgical operation. The best proof of the real character of the milder cases is found in the sequelæ which sometimes occur. Paralysis of the throat, essentially a post-diphtheritic condition, occurs after sore throats so mild as not to have required treatment, and only remembered when the physician seeks a cause for the paralysis.

Unfortunately, mild cases at the beginning, do not always remain mild throughout the whole course of the disease. Marked extension of the process, with the occurrence of septic symptoms, may come on at any time, and if such a period be waited for, before the diagnosis of diphtheria is made, the golden opportunity is lost. Now that it has been settled beyond all cavil that the false membrane is the place of formation of the poisons which produce all the symptoms of this disease, it is clear that the time for interference is at the beginning of the trouble, and not after great extension of the membrane has made its destruction almost impossible. Therefore the time for diagnosis is early, and the first appearance of a false membrane in the throat, no matter how slight, no matter how mild, is the time to say "diphtheria," and to act accordingly.

Diphtheria should be defined as a false membrane existing upon a mucous or wound surface. This meaning of the term should hold, whatever be the anatomical location of the membrane, or whether it occur primarily or as a complication in the course of some other disease, as scarlatina or typhoid fever, or whatever be the particular bacterial cause of the appearance of the membrane.

The term diphtheria has recently been attacked from another quarter. WELCH and OSLER of Johns Hopkins propose that the term diphtheria shall be reserved for the conditions produced by the Lœffler bacillus, while other processes in the throat characterized by the formation of false membrane shall be denominated pseudo-diphtheria. It does not appear that their diphtheria and pseudo-diphtheria differ from each other, except in their etiology; distinguishing clinical differences are not pointed out. With all due deference to the men making this proposition we respectfully submit that such nomenclature would lead to inextricable confusion. The term diphtheria has already attained a definite clinical significance, and if this significance can not

be made to harmonize with recently discovered etiological factors, the necessary change in nomenclature should be applied to the etiological factors, leaving the old term undisturbed in its original meaning. The term "amœbic dysentery" is a good example of this method of nomenclature.

The difficulty already met, with regard to diphtheria, indicates some of the troubles to be met in classification of diseases, with advancement in etiological information. Theoretically, a scientific classification of diseases can only be made upon an etiological basis, but if the etiological classification can not be made to harmonize with clinical differentiation, it will fail of its object.

With regard to diphtheria we plead for its retention as a purely clinical term, to be employed in the sense already defined, and we further plead that all false membranes in the throat shall be recognized as diphtheritic, and treated accordingly.

HABITUAL ENDORSERS OF NOSTRUMS.

The *Western Druggist*, November, states that the same clergymen and women who gave such rose-colored testimonials to the HUBBARD AYER concoction of cocaine in poor sherry, are now among those who are bolstering up the "gold cure" for inebriates. The same journal makes mention of another and stranger incident regarding this same "cure." A physician has begun a libel suit against the proprietor of the fraud. The former addressed a letter of inquiry about the plan of treatment, and was thunderstruck to find himself enrolled among the drunkards who had been cured. This kind of endorsation of nostrums is one habitually used by the receivers of the letters, although not so intended by their authors. When the people begin to "poke fun at" or ridicule a quackish undertaking, its race must be nearly ended.

TURPENTINE IN POST-PARTUM HÆMORRHAGES.—When ordinary means have failed a piece of linen saturated in turpentine, introduced into the uterine cavity and compressed against its walls, excites contraction of the womb and instant arrest of the bleeding.—*Ex.*

NECROLOGY.

James Watt, M.D.

[Memorial minute respecting our late Fellow, Dr. James Watt, read at the November meeting of the Kings County Medical Association, Brooklyn.]

James Watt, M.D., a member of this Association since 1887, departed this life September 10, 1891, in his forty-eighth year. He was a Scotsman by birth, having had Aberdeen for his natal town. He was born in 1844. When 5 years old he was brought, with other members of his family, to this country, and to this city about two years later. He was here educated, and entered upon the practice of pharmacy as a preliminary to taking his medical degree. He attended lectures at both Bellevue Hospital Medical College and the Long Island College, receiving his diploma from the latter school in 1866, when he was 22 years old. After his graduation he made a visit to Scotland, but did not there undertake additional medical courses, as has been stated, since his stay abroad was only for a short time. He made his home for life in the Southern District, living for the twenty or more years of his professional activity chiefly on Court, Union and Carroll streets. His last abiding place, on the corner of Court and Carroll streets, has been, for that part of the city, one of the best known medical situations for four decades. In 1870, Dr. Watt joined the county organization, and about five years later was chosen Surgeon to the Southern Dispensary. He had a strong predilection for political life, and was measurably successful in his combinations therein. He served one term in the State Assembly, being elected from a district which commonly went against his party, for he was undoubtedly widely known and very popular. He was not so successful when running before the county at large for the position of Coroner. He held appointive positions in the Department of Health, as Registrar of Vital Statistics, and in the Police Department as Surgeon under two changes of administration. He was partial also to the work of the National Guard, which he entered first as Assistant Surgeon of the Thirteenth Regiment, under appointment by Col. Mason. He served in that capacity eight years, when he was promoted Surgeon of the Fifth Brigade, on the staff of Gen. Christensen. As a practitioner Dr. Watt was diligent, earnest and persistent, so that, with much of inherited Scottish grit and thrift in his mental make-up, he won a large measure of success, in the face of not a few obstacles at the outset of his career. He was a member of the Physicians' Mutual Aid Society, and many other social and professional organizations.

R. M. WYCKOFF, M.D.,
T. M. LLOYD, M.D.

Julius Guenther, M.D.

Some philosopher has said that as man comes unconscious into the world, so, next to the life upon which he then enters, the greatest boon that can be granted to him is to be permitted to take leave of that life unconsciously. The friend whose memory we would here perpetuate was thus favored, having, after a lingering disease, passed away quietly and unconsciously, August 17, 1891.

Dr. Julius Guenther was born in Berwalde, Saxony, in 1827. He came to America in 1853, and continued the medical studies which he had previously pursued at the Universities of Leipsic, Halle and Vienna, graduating at the New Orleans School of Medicine in 1857. He first came to this county in 1859, practicing his profession at Coatsburg for two or three years, then returning to New Orleans, where he remained until 1865. The next twelve years were spent partly upon his farm near Coatsburg, and partly in New Orleans. Coming North for the last time in 1877, he settled in Quincy, and has since been among our most active members. As a man, Dr. Guenther was upright, mindful of his duties as a citizen, and a model in all his domestic relations. As a physician, he was skilful, conscientious and untiring, always a student, loving his profession, zealous for its advancement and jealous of its dignity.

In token of its appreciation of the worth of its late President, Dr. Julius Guenther, in all these relations, in recognition of the loss it has sustained, and with profound sympathy for the bereaved kindred whose loss is still greater, the Adams County Medical Society places this memorial minute upon its records.

CHARLES W. ROOK, M.D., Sec.
Quincy, Ill.

B. S. WOODWORTH, A.M., M.D., died September 10, 1891, at the age of 72 years and 7 months. For over fifty years he had been actively engaged in the practice of medicine in Fort Wayne, Ind., and for all these years had been standing at the head of the profession as a highly cultured, conscientious physician. In fact, he was far above the average of his day, both in literary and medical attainments, and was a most valuable man in the community. That he was tenderly beloved by his professional brethren was demonstrated on the day of his funeral, when all in the city were present. The citizens, in fact the entire city, mourned when his death was announced; how could it be otherwise, a beloved physician, in whom all had confidence, had died. He had been honored by being elected President of the Indiana State Medical Society, and at various times had been President of the County Medical Society.

No physician was ever more highly honored and respected by all classes of citizens and the profession than Dr. Woodworth, and his memory will be cherished for many years.

LEVI IVES, M.D., formerly a member of this Association, departed this life at his home in New Haven, Conn, November 29. He was a native of that city, born there in July, 1816. His father, Dr. Eli Ives, was President of the Association in 1860, and forty years a professor in Yale. Dr. Levi Ives obtained his medical education under his father, and at Bellevue Hospital, New York. The high hereditary name of his family in medicine was honorably sustained by him for nearly half a century, but only as a practitioner and not as a teacher, as several of his kindred have been. He was a consultant physician to the City Hospital, and prominent in his local scientific associations. His son, Dr. Robert Shoemaker Ives, succeeds him upon the staff of the New Haven Hospital. His final illness is ascribed to chronic renal disease.

THE ACTION OF TUBERCULIN UPON THE EXPERIMENTAL EYE TUBERCULOSIS OF THE RABBIT.

Report from the Institute for Infectious Diseases in Berlin.

BY PROF. W. DOENITZ.

Contrary to the negative results of Baumgarten, the author said, in his report before the Society of Charité physicians, that he is now in a position to demonstrate healed tubercular processes accomplished with tuberculin, and which have been heretofore considered as impossible. The author then demonstrated, in the eyes of a number of rabbits, tubercular processes established by inoculation, both with pure cultures and with tubercular tissues, in various stages, from that of the first irritative reaction, occurring about the middle of the third week, to that of the complete cure, the latter resulting in from three to four months, the eye retaining its function as a visual organ.

In the early part of the treatment with tuberculin, the tubercular process is hastened, cloudiness of the cornea and pannus developing rapidly, whereas in the eye of the control animal, the process is slower, with, however, early necrotic processes at the seat of puncture and rapid perforation, this necrosis not occurring when tuberculin in gradually increasing doses was administered. It is immaterial whether the treatment is begun immediately after inoculation, or at a time when true tubercle had been formed. The administration of the product obtained by Klebs from Koch's tuberculin was attended with only temporary improvement; the eyes were eventually lost. The same dose of the unmodified tuberculin, and continued without increase, also failed to produce good results.

The conclusions are:

1. The tuberculin is a sure curative agent for the experimental tuberculosis of the eye of the rabbit.
2. The tuberculin shows its curative effect only after true tubercle can be demonstrated.
3. The first effect of the tuberculin is a transient but severe irritation of the eye.
4. Under the continuous action of the tuberculin, all irritation in the eye subsides.
5. When, before beginning of the treatment, deep-reaching destructive processes have not occurred, the cure results in retention of the visual functions of the eye, otherwise, atrophy results.
6. To a cure it is necessary that the tuberculin be given in increasing doses, and the continued maintenance of a not too slight reaction is essential.—*Deutsche Medicinische Wochenschrift*, November 19, 1891.

BOOK REVIEWS.

HUMAN MONSTROSITIES. By BARTON COOKE HIRST, M.D., Professor of Obstetrics in the University of Pennsylvania, and GEORGE A. PIERSOL, M.D., Professor of Histology and Embryology in the University of Pennsylvania, Philadelphia. Large folio, 13 x 17 inches. In four parts, to contain about 150 pages of text, with 39 full-pages photographic plates from nature, and many engravings. Price per Part, \$5. Limited Subscription Edition. Part I, pages 1-88, Plates i-vii. Philadelphia: Lea Brothers & Co., 1891.

This work is one of the most interesting and artistic contributions to the science of medicine which we have ever seen. It treats of a subject upon which very little of a systematic character has been written. The science of teratology is more than a novelty to the scientific physician. A knowledge of it is of great practical importance to the general practitioner, and to the obstetrician is a *sine qua non*. It would seem that no treatise upon human anatomy could be complete without a more or less comprehensive and systematic discussion of this highly interesting and scientific subject, yet where can we find an anatomy which devotes any attention to this subject, or, at least, which devotes space enough to enable the practitioner to acquire even a fair understanding of the various monstrosities which the human species is prone to develop. As far as English literature is concerned, this is the only work which has so far appeared which is at all systematic or scientifically comprehensive. The works of Förster, Ahlfeld, and particularly that of Geoffroy Saint Hilaire are classics upon this subject, but unfortunately are inaccessible in the original to English speaking and English reading physicians.

In preparing the material for the work before us, the authors did not find it necessary to draw upon European material to any extent. The Wistar and Horner Museum of the Pennsylvania University contains a very valuable and varied collection of human monstrosities, some of the specimens being exceedingly rare.

The illustrations in Hirst and Piersol's work are faithful photographic reproductions of the original, and from an artistic standpoint can hardly be excelled. The type

is clear and beautiful, the text comprehensively descriptive, and free from verbosity. The authors have not attempted profuse padding, and their language has sufficient rhetorical elegance to render its perusal pleasurable. We shall await with considerable interest the appearance of Part II.

THE ENCYCLOPÆDIC MEDICAL DICTIONARY. By FRANK P. FOSTER, M.D. Part viii, Gym-Jab. Pp. 1793-2040. New York: 1891.

This installment of Dr. Foster's great work completes the second third of its promised issue. True to the history of every work of reference that was ever undertaken, this book becomes more and more incompressible as it progresses, and we begin to wonder how the editor will be able to stow away the remaining two-thirds of the alphabet in the four parts yet to issue.

The reputation for scholarship and learning—two different commodities, by the way—earned by the compilers of the earlier parts, is abundantly sustained by the issue just received. We have had occasion to consult the words *hernia*, *hyoscine*, *iridectomy*, *hæmatin*, *jaborandi* and *hospitalism* and the definitions found under them have satisfied us that they are based on "independent reading." The collateral sciences have not been neglected, but they appear to occupy less space than in the earlier parts; as for example, *hygrometer* and its congeners occupy but sixteen lines, while *barometer* was allowed nearly two pages, inclusive of its illustrations. The temptation to shorten up in the use of illustrations, will be inevitable as the page-space dwindles, but these woodcuts, unless they are very good, are out of keeping with the fine text that is provided. The subscribers will not feel any disappointment if only the best ones are inserted. It is almost unnecessary to add that the value of the work increases in almost a geometrical ratio as the later parts come along. Now is a good time for those who have a prepossession against taking books by subscription to break away from prejudice, and take unto themselves a book which has more of usefulness in it than any completed medical dictionary they can procure.

SELECTIONS.

THE BICHLORIDE OF GOLD TREATMENT FOR INEBRIETY.—The attitude of the medical press toward the Keely treatment is very properly that of agnosticism. The general opinion seems to be that the Keely cure will go the way of many other much vaunted specifics, and after the reaction from the stimulating effect of faith will ultimately come the disappointment of relapse.

The so-called cure has brought to public attention the attitude of the medical profession towards doctors who keep secret discoveries made by themselves, or secure patents on such, or otherwise seek to make their discoveries a source of exclusive profit to themselves.

The doctors call this quackery and refuse to have relations with men who practice it, and for this many persons regard the profession as narrow-minded.

But the doctors are right. It is not in their own but in humanity's interest that they hold each other to this rule of ethics. It is the doctrine of the profession—as old as Galen—that the first duty of the doctor is to hu-

manity, that his learning and his skill belong to mankind, not to himself. Hence it is held to be his obligation to give to the profession, for humanity's benefit, whatever discovery or device he may make tending to the saving of life or the mitigation of suffering.

To this, moreover, every physician upon graduation makes oath of allegiance, so that the doctor who violates the ethical rule disregards his own oath. Even the pretension of such an one as to his discovery must be taken as that of a man unworthy of confidence.

The rule is a generous, not a narrow-minded one. It has its source in a high and unselfish conception of duty, and its rigid enforcement is a matter of true morality as well as professional ethics.—*Medical Age*.

AN APPARATUS for the production of local anæsthesia in the mouth, pharyngeal and other cavities, has been brought out by Weisendanger, at Hamburg. This consists of a double tube well protected by a horn or gum-elastic handpiece so as to prevent the warmth of the hand interfering with the production of the cold. Through the inner tube compressed carbonic acid or ammonia is introduced into a small leather bag, in which it expands, producing intense cold, and escaping therefrom by means of the outer tube. Attached to the handpiece above mentioned is an additional sheath which protects the tube from the mucous membrane of the cavity at the depth of which it may have to be applied.

IDENTITY OF THE BACILLUS OF EBERTH AND THE BACILLUS COLI.—At the *Académie de Médecine*, Messrs. Rodet and Roux, of Lyons, communicated the results of their examination of the bacillus of Eberth and the bacillus coli. The conclusion to which they came was that these two bacilli were in reality one and the same microbe, presenting itself in various forms according to the conditions of the organisms in which it was developed.

POST-MORTEM APPEARANCES IN THE BRAIN AND INTERNAL EAR IN A CASE OF PERNICIOUS ANÆMIA (*Annales des Maladies de l'Oreille*).—J. Habermann contributed a communication giving the appearances which he found *post-mortem* in the brain and the internal ear in a case of pernicious anæmia in which a prominent symptom had been vertigo with deafness. There were hæmorrhages of the meninges and brain substance, also extensive hæmorrhages in the semi circular canals. The hæmorrhages were all due to diapedesis rather than ectasis. The author hesitates as to which lesion to attribute the vertigo.

THE SUCCESSOR TO PROFESSOR CARL BRAUN has been elected in the person of Dr. Friedrich Schauta, of the University of Prague, the author of the "Manual of Operative Midwifery" and numerous lesser works. He will occupy the chair of midwifery and conduct the first obstetrical and gynecological clinique.

ARTIFICIAL CORNEA.—The *Berlin. Klin. Wochenschrift* publishes a seventh case of transplantation of cornea by Professor V. Hippel, of Königsberg. Cocaine applied, the non-transparent part of the cornea, down to the membrane of Descemet, was cut by a little trephine and carefully removed. By the same means a similar piece was excised from the whole thickness of the cornea in a young rabbit, and transplanted to the eye of the patient. It filled the wound, and was on a level with the rest of the cornea. Iodoform was applied, and both eyes were bandaged. In six weeks the patient was discharged with a completely transparent cornea.—*Medical Age*.

CAMPBOR menthol will be found efficacious in pruritic and herpetic and eczematous eruptions. It promptly allays local irritation, contracts the capillary vessels and exsanguinates the part.

WHEN IS A SEA VOYAGE APPROPRIATE?—*The Sanitarian* offers the following advice on the subject:

Never send a patient to sea who is compelled to live on a limited diet, unless he can take the requisite food along with him, a ship being the poorest place in the world where to obtain any special article of diet. More ground will be lost by patients under such circumstances, in one week, than can possibly be regained in many months following, on shore, even under the most favorable conditions. There cannot be the slightest doubt in the world that a sea voyage may be, and is, beneficial in a great majority of chronic cases, but it should be a voyage chosen for its especial adaptability to the case in question, and the climate, class of steamers, food, etc., should have the careful consideration of the family physician before he sends his patient on a month's voyage by water, for a lack of information on the physician's part may mean no improvement to the patient, and may mean death, whereas positive knowledge would insure improvement.

MISCELLANY.

DR. PAUL F. MUNDÉ has retired from the editorial control of the *American Journal of Obstetrics*. Dr. Brooks H. Wells is his successor.

CHICAGO MEDICAL SOCIETY, D. R. BROWER, M.D., President.—A regular meeting will be held at Washington Hall, 70 Adams street, on Monday, December 21, 1891, at 8 o'clock P.M. Papers will be read as follows:

1. "Medical Diagnosis of Diseases of the Stomach," by Dr. J. B. Herrick.
2. "Medical Treatment of the Diseases of the Stomach and Duodenum," by Dr. Frank Billings.
3. "Surgical Diagnosis of the Diseases of the Stomach," by Dr. Weller Van Hook.
4. "Surgical Treatment of the Diseases of the Stomach," by Dr. Nicholas Senn.

The discussion will be opened by Drs. N. S. Davis and Ludwig Hektoen.

JUNIUS C. HOAG,
Secretary.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from December 5, 1891, to December 11, 1891.

Capt. Arthur W. Taylor, Asst. Surgeon U. S. A., having been found incapacitated for active service, is granted leave of absence until further orders, on account of disability.

First Lieut. Paul Shillock, Asst. Surgeon U. S. A., is granted leave of absence for fifteen days.

Capt. William E. Hopkins, Asst. Surgeon U. S. A., resignation has been accepted by the President, to take effect April 5, 1892, and granted leave of absence to include that date.

Major Passmore Middleton, Surgeon U. S. A., having been found incapacitated for active service, by reason of disability incident to the service, is, by direction of the President, retired from active service.

Capt. Walter W. R. Fisher, Asst. Surgeon relieved from duty at Ft. Assiniboine, Mont., and ordered to Ft. Columbus, New York Harbor, for duty at that station.

First Lieut. Charles E. Woodruff, Asst. Surgeon, is relieved from duty at Ft. Missoula, Mont., and ordered to Ft. Assiniboine, Mont., for duty at that station.

First Lieut. James D. Glennan, Asst. Surgeon, granted leave of absence for one month, with permission to apply for one month's extension.

Capt. Henry G. Burton, Asst. Surgeon, ordered to report to the President of the Army Retiring Board, at Los Angeles, Cal., for examination by the Board. On conclusion of his examination, will return to his station, San Diego Bks., Cal.

Major Julius H. Patzki, Surgeon U. S. A., will report in person to the President of the Army Retiring Board, at Ft. Leavenworth, Kan., for examination by the Board. By direction of the President.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending December 12, 1891.

Asst. Surgeon Lewis Morris, detached from the Navy Yard, League Island, and to the receiving ship "St. Louis," at that Yard.

Asst. Surgeon H. N. T. Harris, detached from the receiving ship "St. Louis," and to the Navy Yard, League Island, Pa.

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ORIGINAL ARTICLES.

THE PRIVATE CARE OF EPILEPTICS.

*Read before the Massachusetts Medical Society, Suffolk District,
October, 19, 1891.*

BY LUCIUS W. BAKER, M.D.,

SUPERINTENDENT RIVERVIEW SANITARIUM FOR NERVOUS INVALIDS, BALDWINVILLE, MASS.

In nearly every community will be found one or more individuals who are suffering from that peculiarly distressing disease known as epilepsy. Niemeyer places the proportion of such cases at six in every thousand.

In this disease the autopsy and the microscope have afforded us but little satisfaction. There seems to be no fixed and constant pathological lesion attendant upon the wide assemblage of symptoms classified under the name of epilepsy. The few histological changes which have been reported are, it seems to me, to be considered as results rather than causes of the disturbance.

But if our knowledge of the actual pathological changes occurring in epilepsy is vague and unsatisfactory, the results of experiment and clinical observation are more gratifying, for the researches of J. Hughlings-Jackson, Gowers and others have furnished us with a more satisfactory explanation of the phenomena of the disease than any we have heretofore possessed.

According to these observers an epileptic paroxysm is due to a sudden and excessive functional activity of the gray matter in some portion of the brain. This rapid action of certain nerve centres, with its resulting phenomena, is called a "discharge," which may commence in any part of the gray matter of the brain, remain confined to the portion in which it originated, or may extend to and involve other portions; hence the wide variety of manifestations which constitute an attack. There may be, for example, a momentary loss of consciousness, a slight incoherence, or mental blank, without muscular spasm, or the attacks may be of a convulsive character, involving few or many muscles; auræ of the greatest variety may be present, or the patient may have no warning whatever of an approaching seizure, while not infrequently the attacks are preceded or followed by more or less mental excitement.

This rapid liberation of energy in the nervous centres, giving rise to an epileptic paroxysm, may be due either to a sudden diminution of inhibitory power, or to an excessive and rapid generation of nerve force within the cells affected. It is, however, important to remember, that the primary and essential element in the production of a "discharge" is the presence of an inherent instability of certain portions of the gray matter within the encephalon, which may be due to heredity or other predisposing causes, some of which are beyond our power of detection.

The manifestations of epilepsy are such as to usually incapacitate the individual from engaging in the ordinary occupations of life, and not infrequently compel him to become a useless burden upon his friends or upon society. In the vast majority of cases epileptic attacks leave a permanent impress upon the cerebral structure; we seldom meet with a case in which careful study will not detect some evidence of mental impairment. Many terrible crimes have been committed during an outburst of epileptic mania, while all degrees of mental degeneration will be met with down to complete idiocy of dementia.

An epileptic is not only exposed to all the dangers resulting from a sudden loss of consciousness; he may also, in a greater or less degree, be mentally defective. He has therefore a double claim to be dealt with according to his peculiar requirements. But, singular as it may seem, when we consider the nature of his malady, these claims have, in this country at least, been almost entirely ignored.

At present the only place, to my knowledge, in which an epileptic can be received for care and treatment is in institutions devoted to the care of the insane, and these are obviously unsuitable for this class of cases. Hospitals for the insane are intended only for the treatment of mental diseases. This is their special office. They were never designed for the treatment of epileptics, any more than for the treatment of dipsomania, and it is a manifest injustice to send an epileptic to one of these institutions. Such a course cannot but be detrimental to both classes.

During their freedom from attacks, epileptics resent the companionship of the insane, while the latter ought never to witness the wild contortions

or to hear the piercing cry of an epileptic seizure. *So far as the care which society extends to its afflicted members is concerned, a man had better be insane than an epileptic.*

I am well aware that the medical profession generally entertains a gloomy view with regard to the results of the treatment of epilepsy, and that the opinion prevails that it is an incurable disease. Granting for a moment that this is correct, is not the same equally true of many other diseases, the severity of which we are able to relieve materially by judicious care?

One advantage, among others, which the long-continued hospital treatment of epilepsy will secure, is the administration of the necessary remedies with unfailing punctuality, and the proper regulation of the diet, two important factors in securing a favorable result. The difficulty of securing these necessary conditions will account for many failures in the treatment of this disease in private practice. I have frequently had patients remain entirely free from attacks during a hospital residence of months, but have known the seizures to return soon after their removal to home surroundings.

In an interesting paper¹ read before this Society last December, Dr. W. N. Bullard called attention to the lack of proper facilities for the care of the pauper epileptics of Massachusetts, and urged that separate provision be made for this class of patients. The subject was quite fully discussed at the time, and at the last annual meeting of the Massachusetts Medical Society, a committee was appointed to present the matter to the Legislature. Should any action be taken by the State, I presume that certain cases of epilepsy, now in the State hospitals for the insane, will be separately provided for, as will also those cases now in institutions for children, who have reached adult life.

Several years ago I became interested in the care of epileptics in connection with a small charitable institution for children, which was then in its infancy, and which was one of the first in this country to provide special accommodations for this class of patients. At that time we received a few patients who were beyond the age of childhood, and also foresaw that a difficulty would arise within a few years as to what should be done with those who, coming under our care as children, should remain until they became adults. This is now proving a serious problem to the managers of the same institution, whose capacity has since been largely increased. Their last report says, "that of the reported number of cases of epilepsy a very large proportion is above the age of fifteen years. As a rule, parents prefer to keep their own children if possible, and while they are young it is generally possible; but after they get to larger years the

difficulty of managing them becomes more than the family is willing to undertake, or the friends to permit. They are then reported as epileptic and a place of asylum is sought for them. The larger number of our applicants is of this class. The number is a growing one, and the time is near when provision must be made for the hospital care of a considerable number."

The older cases of epilepsy are manifestly out of place in an institution for children, but as yet there is no other place to which they can be sent, except the insane asylum or almshouse. As the matter of providing for adult pauper epileptics was carefully considered last December, it is not necessary for me to discuss it further at the present time. I desire rather to call your attention briefly to the desirability of also providing suitable accommodations for epileptics whose friends are able to pay a moderate sum for their support.

No one who has not had practical experience with such a patient can appreciate the continuous strain which an epileptic occasions in the family to which he belongs. The constant liability to disastrous falls or injuries, the mental hebetude, the irritability, the peevishness, the unearthly cry, the distorted features, the wild contortions are a continued source of care and anxiety which few can long endure without injury.

In the ordinary home, an epileptic can seldom obtain the care which his condition requires. The wealthy can, of course, provide separate apartments and special attendants, but even these often prefer accommodations elsewhere. I have had such cases under my care in the past, and within a few weeks I have had a most urgent request to receive an epileptic patient, whose parents are both able and willing to pay well for his care. Similar letters come to me from time to time showing that there is a demand for such accommodations even among those who are amply able to care for their friends at home.

But the burden rests heavily upon those in moderate circumstances, whose means will not permit their entrance into a strictly private institution even if they could be received. Such cases are willing to pay all and even more than they are able.

I doubt not that there are many cases of epilepsy among the middle classes, who for their own and others' sake ought to be taken care of away from home, but whose friends will not allow their removal to any strictly charitable institution for epileptics, did one exist.

The scale of expenditure demanded in the private asylums is such as to place them beyond the reach of people of moderate means, and even those whose circumstances will enable them to command the resources of these institutions are debarred from entering them on account of the nature of their disease, for epileptics ought not

¹ Boston Med. Journal, vol. cxxiv. p. 25; discussion, p. 36.

to be associated with nervous or mental cases, in the same institution, or even within the same grounds. I speak from experience, as I once had a cottage filled with mild private cases of epilepsy, but was obliged to send them all away, on account of its close proximity to another building in which there were other nervous patients.

It seems desirable, therefore, that these cases should be provided with suitable accommodations away from other patients, and at a sufficient distance to prevent annoyance to the community in which they may be placed. The buildings should be arranged with special reference to the peculiar requirements of those who are to occupy them. A one-story structure will be preferable, and the house and its furnishings should be constructed so as to diminish as far as possible, the liability to injury from falls.

I can see no serious obstacle to the establishment and maintenance by benevolent people of small institutions for the care and treatment of non-pauper epileptics. Such an establishment in my opinion should be entirely free from State control. It should be managed by a board of trustees as a private institution, with nothing in its name to characterize its special work.

The building should be located in the midst of ample grounds, without neighbors in its immediate vicinity, and provision might as well be made for a variety of light occupations, as during the intervals between the attacks many epileptics are able to work, and are much better for being occupied. The house should also be furnished with all the comforts to be found in the homes of people of moderate means, so that the home-like atmosphere may be continued as far as possible. If suitable rooms were provided I have no doubt they would soon be occupied by those able to pay a large sum for their accommodations, thus diminishing the expenditure of the institution.

In brief, I would furnish this class of epileptics as I would many of the milder cases of insanity, with all the comforts of a well-ordered home; with trained attendance and with skilled medical care at a price within their limited means.

I am well aware from personal experience that such accommodations will be quite expensive. To carry on such an institution successfully the amount received for board must be largely supplemented by the contributions of benevolent people able and willing to aid such an enterprise. An endowment fund will be of the first importance, and this would doubtless be secured as soon as the necessities of this class are fully understood.

It is our pride and boast that Massachusetts never turns a deaf ear to the cry of the sick and the suffering, that no worthy enterprise lacks support among us. I trust that the time is not

far distant when to our long list of benevolent enterprises will be added one or more devoted exclusively to the treatment of epilepsy.

SOCIETY PROCEEDINGS.

Massachusetts Medical Society, Suffolk District.

SECTION FOR CLINICAL MEDICINE, PATHOLOGY AND HYGIENE.

ALBERT N. BLODGETT, M.D., SECRETARY.

The meeting was called to order Wednesday, October 21, 1891, at 8 o'clock, by the Secretary. The first business was the election of a chairman. Dr. E. G. Cutler was unanimously re-elected to that office.

Lucius W. Baker, M.D., Superintendent River-view Sanitarium for Nervous Invalids, Baldwinville, Mass., read a paper on

THE PRIVATE CARE OF EPILEPTICS.

(See page 983.)

Mr. F. B. Sanborn, formerly Inspector of State Charities, opened the discussion.

I have been long acquainted with Dr. Baker and with his interest in this subject; the care of epileptics. I do not know whether Dr. Baker attempted to give any estimate of the number of epileptics in Massachusetts. I have never been able to arrive at any estimate. The census does not give any estimate. Within a few days, however, expecting to listen to Dr. Baker here, I endeavored to look up the matter. I went to the different boards in Boston, and I find it is not in the possession of any board or bureau in the State, and can only be arrived at by estimate. I suppose we have at present in Massachusetts not less than 8,000 insane and idiotic persons. The census may not show so large a number. Now of those two classes a definite proportion, not less than 5 per cent., is always found to be epileptic. I estimate, therefore, that if we have 8,000 persons mentally affected in Massachusetts, we must have from 400 to 800 epileptic persons among them, in the later stages of epilepsy ordinarily, where the mind has been seriously and oftentimes permanently affected. There must be at least double this number, I suppose, of persons where epilepsy has not yet reached this stage. It may never get so far. I therefore suppose that we must have in Massachusetts from 1,200 to 2,000 persons of the epileptic class. This number, probably, is constantly increasing as our population increases.

Now the State has made no provision, separate from the care of the insane, for this class of persons, except in the small institution which Dr. Baker founded at Baldwinville, and which contains at present something like eighty epileptic

children in the hospital cottages. Most of these are persons belonging to the pauper class; that is to say, come from families not able to pay even the small sum which is required in the institution for the board of the children (amounting to about \$3.25 per week), and therefore are supported either by the State or by the gifts of benevolence. There are some supported in the almshouses, etc. There is, in addition to this class of the epileptic poor that must be supported by the taxpayers, a considerable class of persons whose friends are able to support them, but have absolutely no place to which they can be sent, where they can receive special attention apart from other patients, which epilepsy requires. That is a serious deficiency in our charitable system. It is one in which Massachusetts is not alone by any means. There is no State in the Union, I think, which maintains a special institution for epileptics which is sufficient to receive the epileptic persons of that State, and few of the countries of Europe have any such institution. There are several excellent institutions for epileptics in Europe; but in Massachusetts we certainly are able to support, and I think the munificence of individuals will be ready to organize, an institution for persons of small means, who can afford to pay the expense of placing their relatives in such an asylum. It would be necessary, I suppose, to begin in a small way, and probably it would be found desirable not to increase the number of inmates of such an asylum to anything like the number treated at Bielefeld. That would be my own view of the subject. The public authorities will provide in their own manner, and they will constantly improve, the treatment of their own cases. They will provide for the epileptic poor; but the other class will be compelled, until some such asylum is established, to be sent either into families, where oftentimes they can be properly treated (but by no means the whole number can be so disposed of), or else into asylums for the insane, where they not only very much disturb the treatment of the patients who properly belong there, but fail to receive the treatment which they themselves require.

The case of Barber, reported in the *American Journal of Insanity* by Dr. Wise, which came under my personal observation, illustrates well the dangerous homicidal tendencies of some epileptics.

I suppose there is hardly a person in this community who would be less suspected of epilepsy than Richard Barber was for months and years before this homicide; and yet he, being subject to a species of latent epilepsy, seizures occurring only in the night, had fallen into the dangerous and distressing condition which epilepsy sometimes produces, that is homicidal fury, which will cause an assault upon any person within reach of the epileptic. He had killed his two

best friends in America, and when it was over he was unconscious of the deed.

This is one of the dangers to which any community is exposed which makes no provision for its epileptic subjects.

Mrs. Mary A. Livermore: While Mr. Sanborn was talking, I have been running over in my mind and trying to make a *résumé* of the number of persons I have known who have been afflicted with epilepsy in the last thirty-five years. I am able to recall forty-two. The results of my observation have convinced me that this affection is much more common than one would think. I have not found that a very large proportion of epileptics are connected with the very poor people, or those whose lives have been exceedingly barren of comfort or nourishment, or who have been very much vitiated by bad habits or bad methods of living. Almost all the epileptics whom I know are so situated that they could pay for care in an institution, if there were one in which they might be received. They could not pay fabulous prices, but could pay *something*. Of the eighty epileptics now in the hospital at Baldwinville, I am informed that forty pay *something*. So that it does not seem as if it would draw so very largely on the funds of those charitably disposed if this matter were attended to.

Everything that has been said concerning the difficulty of taking care of epileptics in the *family*, is so true that it cannot be overstated. It is not a possible thing, unless one can set apart rooms for the epileptic, and have one person in charge of him constantly. I have found that in cases where the epileptic could be absolutely under control in regard to habits of rising and retiring, food, etc., the horror of the thing could be mitigated, and the person made companionable and attractive in the family. I believe the frequency of attacks may be greatly diminished by strict attention to food, habits, etc.

Mrs. Livermore described at length an institution for epileptics in London, in which the different classes of epileptics received treatment suited to their condition.

Dr. T. W. Fisher: When the subject of a new hospital is broached, the questions always arise, Where are the patients coming from? Is there a sufficient number of patients of that kind to avail themselves of the new institution? Perhaps these are not difficult questions to answer, for I do not know of any hospital so large that it could not be filled in six months.

The question of epilepsy is interesting, like everything connected with the subject. I was unable to get any facts in regard to the number of epileptics in Massachusetts; neither could I find directly the number of epileptics in our State hospitals in Massachusetts. The statistics deal with admissions only, and not with the number of resident epileptics. The number of epileptics

in my own hospital, which contains 435 patients, is twenty-seven, or about 6 per cent., and 6 per cent. of the number in the State hospitals would be about 300. The number admitted to the State hospitals for eleven years I find to be 731 cases of epilepsy. In that number 17 recovered and 231 died, showing an extremely high death-rate, and an extremely light percentage of recovery. Perhaps some allowance is to be made, because recovery from epilepsy is rather deceptive. The United States census for 1880 shows 74,184 insane in the United States, of which 6,842, or 9 per cent., were epileptic. In 1880 I find that there were 281 epileptics in the State institutions, or 6 per cent. of the number of insane.

In Berlin the number of insane in the city has increased very rapidly, much more so than the population; and the number of insane in the hospitals of Berlin, public and private, in 1890 was 22,659, including idiots and imbeciles and epileptics. Of this number 494 were epileptic, showing 19 per cent. against six per cent. in this State, so that our proportion of epileptics in insane hospitals is much less. At Bielefeld, which I visited, I saw institutions for the treatment of epileptics containing 100, who are mostly pauper epileptics, and who are taken care of in a most suitable and creditable manner. I saw one immense dormitory containing nearly 100 epileptics, having beds about twelve inches high, so that the person could receive no injury by falling out of bed at night. That ward was under constant surveillance during the night, and aggravated cases were at once removed to the adjoining sick-ward. But the number of epileptics in Berlin has increased so rapidly, as well as the insane, that they are about to build a separate colony hospital for about 600 epileptics. This meeting is not especially concerned with that class of epileptics, but the statistics may be of some interest. The increase of insanity in Berlin and Germany, which is far beyond that of the population, is also the same increase as seen in the United States. In 1881 the number of insane in the United States in hospitals was fixed at 56,205, in 1889 the number was 97,534, an increase in nine years of about 75 per cent., while the population has increased 25 per cent.

There is no doubt about there being enough epileptics of the class mentioned, in the State, to fill any hospital that the benevolently inclined are likely to erect. Being connected with a public hospital, I see fewer of the cases of epilepsy of this sort, than physicians in practice outside; and I do not imagine that this new institution would make any great drafts on the State hospital or city hospital for insane. The cases that go to those hospitals are generally the long-standing cases in which the mental symptoms are very pronounced, and the great majority of them also are from the non-paying class.

I now and then see cases in private practice which would be good subjects for hospitals of that sort.

Dr. Baker did not speak of one important point, and that is the legal status of patients in an institution of the kind he described. The epileptics in an insane hospital are all classed as *insane*, can be detained and controlled as if they were insane, and in these hospitals in Germany the status is the same.

Although these hospitals might be very readily filled, the population, I fancy, would be somewhat fluctuating and changing. An adult epileptic is apt to be very self confident, and make very light of his disease. While he might for a time subject himself to treatment in an institution, there would be the probability that after a shorter or longer time he would insist upon going at large. He would dislike the restraint and confinement of an institution, no matter how pleasant and homelike a character it might possess; and I think, to give such an institution the highest value, the patients ought to be committed as they would be in any private institution for the insane. There is no doubt that such an institution would do great good.

Epilepsy, if curable at all, is curable in the very early stages and in the earliest years and months of the disease, and it would be at that early period that the treatment in such an institution would be of most value. The prospect of cure, however, in any stage of the disease is not brilliant, I must admit; but the benefit to be derived by prolonged care and attention is exceedingly great. Not only is the epileptic very much benefited, but the community and the family are protected from the evils that are consequent upon this condition.

Dr. J. J. Putnam:—I came here fully impressed with the very great importance and difficulty of this problem, and not at all prepared to offer a solution of it. I feel that the subject is a very large one, and I do not think that even yet we have entirely covered it. There are certain points on which I suppose we shall agree. First, we all should admit, I think, the great desirability of such an institution as Dr. Baker spoke of for pauper epileptics, since they are a great drain on the happiness and well-being of the families in which they live. Then comes the question of the class of the well-to-do patients. It seems to me the case is quite different, and we are obliged to individualize very much more largely. Dr. Fisher alluded to two points which seem to me of great importance. In the first place, that we should have a right to detain these people so that we might be able to protect the community from such persons as Mr. Sanborn has spoken of.

I have been treating these patients at an outpatient department for twenty years, and I know of many cases of epileptics who live at home hap-

pily and support themselves. But supposing persons could not be detained the greater part of their lives in such an institution, they might be kept long enough to ascertain what for them was the best treatment, and their friends and relatives could be urged to carry it out. I agree that the hygienic treatment is by far the most important.

I think such a hospital would be of great service for purposes of study of this disease. When it comes to the life-long separation of such patients from their families, the difficulties become much more manifest. It is doubtful whether we have the right to expose other epileptics to the danger of homicidal patients.

Although children could be made pretty happy in such an institution, it is very doubtful whether adults could be easily made happy in such a place, and I think we are bound to consider their welfare as well as that of their friends. Most epileptics are to a great degree ignorant of the severity of their attacks. In such an institution as this they would have these attacks constantly before their eyes and it would add greatly to their sufferings.

It seems to me, although such an institution might be very useful, that it should be gotten up, not on the plan corresponding to the colony system, but on the plan of the boarding-out system, which has worked so well with children difficult and hard to manage. I think it would be possible to find a considerable number of first-rate homes where epileptics could be taken and kept almost singly, and at the same time the advantages of this mode of treatment over that in the hospital, would be, so far as the patients are concerned, very great.

Dr. Morton Prince:—I am very glad to have an opportunity to endorse the views of the reader of the present paper. It seems to me the need of a hospital of this kind is a self-evident proposition. It seems a most extraordinary fact that while provision has been made for people suffering with almost every other disease, no provision, public or private, has been made for the epileptics. The deaf, dumb, blind, and even persons with nervous prostration, now have a hospital; but the epileptic has nowhere to lay his head. The necessity for such a hospital seems to be shown by the fact that in other countries, on the Continent particularly, they have provided hospitals for epileptics, although not for the particular class to which Dr. Baker refers. I have made attempts to ascertain the number of epileptics in Massachusetts, but they have been unsuccessful. I had the curiosity to see how many cases were treated at the City Hospital in the course of a year. I found that in the course of one year forty-one patients applied there with epilepsy. The Massachusetts General Hospital does not publish in tabular form the diseases treated there; but if we assume that the same

number apply there, and a similar number at the Dispensary and the Carney Hospital, that would be 120 a year at the different hospitals of the city. Of course, that is a mere estimate; so that, as the life of an adult with epilepsy is not particularly shortened by the disease, in the course of ten years 1,200 epileptics would accumulate in the community. Of course, all these cases would not be appropriate for such a hospital as has been described, but a large percentage would. These figures are interesting as throwing some light upon the frequency of the disease as it is met with.

I have found the treatment at the out-patient service of the hospital very unsatisfactory for more reasons than one. It is very difficult to control the patient, to get him to follow systematically any course of treatment. The treatment is not perhaps very encouraging to them. I think there is no question that the treatment would be far more satisfactory, whatever may be its shortcomings, in an institution of the kind outlined by the reader, than by treatment in private practice or in hospitals. I think that an institution should be arranged on very economical principles. The cost for patients should be low, not over that which now obtains in most of our general hospitals, about ten dollars per week. If we estimate that the average patient could pay five dollars per week, that would leave five dollars per week, as the cost of each patient to the hospital. I should rather doubt the advisability of farming them out in the way suggested by Dr. Putnam, in private families. It seems to me the hospital plan or cottage plan would be by far the better system. Of course, that is a secondary matter.

Dr. F. W. Page: I notice that Dr. Baker speaks of epilepsy as generally incurable. I am aware that a great many physicians take a pessimistic view in regard to epilepsy; but I think a great many cases have been cured, and a great many so far improved as to be useful to themselves and to their families. When I say *cured*, I speak it advisedly. Some patients may not have attacks oftener than once in six months, some once in a year. I can recall cases of epilepsy which have been cured, and have now remained so for many years.

There will always be difficulty attending the getting at the exact proportion of epileptics in the State. It is a matter of serious import to the family. A great many do not like to have it known that they have an epileptic in the family. In the establishment of a hospital it has occurred to me whether it is wise to have it known that it is an *epileptic* hospital, and whether such an hospital might not be joined to some nervous asylum, say, to be considered as a sort of home where patients could have proper care, and not have it definitely known that they had gone to a distinctively epileptic hospital.

The farming out that has been suggested does not seem to me quite practicable.

I doubt whether it would be advisable to have a single hospital for both children and adults. It seems to me, as the State has provided a small hospital for the care of children, that this could be gradually enlarged, and another one could be built for the care of adults.

Dr. Walter Channing: The tendency of modern times has been toward some form of institution-provision for the weak and defective classes, whereby they could receive physical and moral treatment which would improve, or ameliorate their unfortunate condition.

At the foundation of this movement, long before modern times, there existed the necessity that society should protect itself, and hence all kinds of dangerous persons were shut up like wild animals, that they might do no harm. Anything like reformation or moral treatment was of very little moment.

It is only necessary to refer to the treatment of insane persons to see this exemplified. Up to one hundred and fifty years ago the insane can hardly have been said to have had medical treatment. They were supposed to be possessed by evil spirits, and discipline and punishment were resorted to, to get rid of these spirits. At Bethlem (in London) the treatment was terrible, and nothing could have been worse than that at the Bicêtre.

St. Luke's, in London, was founded in 1751; and Letchworth says this was the first English hospital where curative principles were put into practice.

By a curious coincidence, the first step toward giving the insane hospital treatment in this country, was taken the same year, that being the date when the insane department of the Pennsylvania Hospital was established by legislative enactment.

Mr. Letchworth says of the latter: "At this time (1751), punishment in one form or another was, in general estimation, regarded as second only to bleeding, purging and dosing. Even when, in 1783, the philanthropic Dr. Rush resolved to relinquish the chains and whips of his day, he still adhered to 'mild and terrifying modes of punishment,' and on paying a visit to an insane man, deemed it one of the first requisites 'to look him out of countenance.'"

During the next fifty years, as every one knows, rapid improvement in the treatment of the insane in *insane institutions under adequate supervision*, took place, though so much cannot be said of the treatment of the insane in almshouses and in their own homes, as the labors of Dorothy Dix amply testify. Still, up to within the last forty years, we will say, the total number of insane in institutions was not large.

In his admirable report made in 1855 to the

legislature, Dr. E. Jarvis gave the total number of insane in the State as 2,632, of whom 1,141 were in hospitals. Thirty years after, or in 1885, there were 5,263, according to the general census, which was probably not nearly as accurate as the census of Dr. Jarvis. If it had been, the increase would probably have been larger still, say upward of 6,000, as suggested by the Report of the Board of Health, Lunacy and Charity for 1885.

On October 12, 1885, there were 3,862 insane persons in our State institutions, 3,350 of these being in State hospitals. In thirty years it will be seen, there was an increase of over three hundred per cent. in the insane hospital accommodation, the increase in the total number of insane persons being about half that. In the five years since 1885 the number has increased from 3,862 insane persons to 4,701 in our State institutions, a gain of 839 in this short period. The data furnished in a recent bulletin of the Census Bureau show an increase of 73.33 per cent. in the total number of insane persons treated in institutions during the nine years ending 1889.

These few figures strikingly demonstrate how absolutely essential institution-treatment of the insane has become. They indicate that regular systematic treatment, under medical direction, and supervised by the State, is the chief means whereby a helpless class can receive adequate care.

What is true of the insane is equally true of the other defective classes, but the need, being less urgent, is only just becoming apparent.

Take the idiots, for example. From figures kindly furnished me by Dr. W. E. Fernald, Superintendent of the Massachusetts Asylum for Feeble-minded, I find there were in 1880, 76,895 idiots in the United States, only 2,429 of these being in institutions for idiots. During the last ten years, Dr. Fernald thinks the number of institutions for idiots has at least doubled.

We are at last waking up to the fact that idiots can be immensely improved by regular, systematic treatment in the institutions, under proper supervision on the part of the State.

Do not the same general arguments hold good in the care of epileptics as in the care of the insane and idiots? They represent a degenerate type of human being, prone to sink to a lower level if left uncared for; and, in sinking, they drag down others as well as themselves. They cannot be expected to improve any stock, but to act largely as a demoralizing influence on their environment. They are a weak link in the chain of evolution, and pretty certain to snap unless they can be relieved from the friction and strain of the sound links. Place them under favorable institution and supervisory treatment, and it is inevitable that marked amelioration in their condition will show itself, and

the community will be relieved of a menace to the vitality of the race, and a burden on its shoulders which it does not now know how to bear.

These are times when we are making a conscious or unconscious struggle, perhaps, to strengthen the race on its physical side; and one most important means of doing this, is to weed out the weak and degenerate. Place them by themselves where they will do the least harm and receive the most good, and leave the healthy individuals in the community to establish and perpetuate a stronger, sturdier, and better type of man.

Dr. Baker:—I only wish to say a word in conclusion. I am quite ready to admit all the criticisms Dr. Putnam has made. In my paper I made no claim, nor did I attempt to cover the whole field of epilepsy. I am too well acquainted with the different manifestations of epilepsy to advocate any such institution; especially of the semi-private kind which I have urged in my paper. I only maintain that a semi-private institution should be established for people of moderate means. I would make it purely voluntary.

The Chair then appointed as a committee to consider the matter brought up by the reader, Drs. T. W. Fisher, Morton Prince, Walter Channing, with Dr. Baker as one of the members of the committee.

Dr. Henry Fraser Campbell.

Dr. Henry Fraser Campbell died December 15, after an illness of some weeks. He was born in Savannah, Ga., February 10, 1824. His father, James Colgan Campbell, a native of County Antrim, Ireland, belonged to a family of the Presbyterian Scotch Irish Campbells. His mother, Mary R. (Eve) Campbell, a lady of fine intellectual endowments and high culture, was the only daughter of Joseph Eve, a name once familiar as connected with the early history of the cotton gin. This gentleman was the father of Professor Joseph A. Eve, of Augusta, and of Dr. Edward A. Eve, and the uncle of Prof. Paul E. Eve, of Nashville, who were the preceptors and trainers in medicine and surgery of Dr. Campbell in the earlier periods of his life. His education and moral culture, with that of his only brother, Dr. Robert Campbell, were carefully superintended by his mother, aided by his uncle, Dr. Robert Campbell. He began the study of medicine at the age of 15, and his career has been a most successful one. From a student he rose to high positions in the Medical Department of the University of Georgia. During the war he volunteered his services, and was afterwards commissioned regularly as a surgeon in the Confederate Army. After the war he was called to New Orleans, where he filled the chair of anatomy, and

later of surgery, in the New Orleans School of Medicine, but on account of ill health returned to Augusta. By his studies, lectures, and contributions to the literature of the profession, he has made his labors of great benefit to his profession and to mankind. Few medical writers in this country worked in so wide a field, or presented themselves with a personality recognizable in so many distinct departments, and he soon became familiar to the medical world, receiving honors from associations in Europe and the United States, having been elected President of the American Medical Association in 1885. He was the second Southern man to hold this position.

A MOTLEY LOT OF IMMIGRANTS.—The Report, to the State Board of Health, of inspection of immigrants at Port Huron to exclude dangerous diseases, during the first five days of December, shows the chances of the introduction of such diseases, because the immigrants passing through Michigan to States beyond are from so many different countries. The numbers and nationalities were as follows: Nine Arabs (from Jerusalem), seven Austrians, 1 Belgian, 36 Danes and Swedes, 2 Egyptians, 4 French, 15 French Canadians, 44 Germans, 4 German Jews, 4 Greeks, 23 Italians, 12 Irish, 5 Poles, 2 Portuguese, 6 Russians, 7 Russian Jews, 32 Scotch and English, 17 Scandinavians and 4 Swiss.

Their destinations were mainly "to Chicago and the Northwest;" but one was bound for the city of Mexico, so even that distant country might be interested in an inspection at Port Huron to isolate dangerous diseases. On four out of the five days, there was disinfection of baggage.

TO EMPTY A DISTENDED BLADDER.—To empty at once a distended bladder, is to expose the patient to the danger of a vesical hæmorrhage; it is necessary to desist as soon as the urine does not escape in a jet, but falls in dribblets, drop by drop.—*Med. Record.*

REMEDY FOR WARTS.—Consists in Fowler's solution, which given in weekly increasing doses, to adults two drops three times a day; to children, one-half drop three times a day.

LACTATION INDUCED BY MASSAGE.—A parturient patient of Dr. Mensinga (*Der Frauenartz*, February, 1891) had never been able to suckle her children properly. On this occasion, the breasts were quite undeveloped; the practice of allowing the child to suck the dry nipples caused the mother great nervous irritation. Massage was practiced, the breasts steadily increased, and on the seventh day the child was suckled. Early in February the mother was still suckling her child, and both were doing well.—*N. Y. Med. Times.*

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SATURDAY, DECEMBER 26, 1891.

LOOKING BACK.

To take a retrospect of the past, adjust and balance accounts, is the common custom at this season of the year, and lest we appear singular, we will for the moment glance back over the work of THE JOURNAL during the past few months.

During the last half year there have been published in THE JOURNAL more than one thousand pages of reading matter, constituting a large volume, and containing one hundred and sixty-three contributions, in which is displayed the truly National character of THE JOURNAL, as may be observed in noting that thirty-three of the articles are from New York; twenty-nine from Pennsylvania; twenty-two from Illinois; fourteen from Ohio, corresponding with the ratio in population of these four most populous of the States. Twenty-two other States, including Canada and England, are well represented by contributors. Thus fairly have the pages of THE JOURNAL reflected the labors and thought of the medical profession of this country.

That the showing is highly creditable, may go without saying. Our readers know that its character is a sufficient stimulant to inspire and bring out the very best work of the very best men in our American profession at the next meet-

ing. Already the officers of most of the Sections have their work well in hand, while their enthusiasm is of the acute, infectious type that is certain to spread, and attack hundreds of new men.

In this issue we publish the list of members and subscribers for THE JOURNAL. This requires eighteen pages, and the number of names enrolled is about six thousand, as against thirteen pages of names published last year.

Here again may be noted ample evidence of the truly National representation and character of the American Medical Association.

LOOKING FORWARD.

This marked increase of members of the Association indicates the attainment of a degree of momentum that is destined ere long to gather into the Association every reputable practitioner of medicine in this country.

At the next meeting in Detroit there will likely be an attendance of more than three thousand delegates, representing ten times that number of members of State and local societies, besides nearly the entire profession in and around Detroit. The estimate of three thousand delegates prospectively in attendance at the next meeting is not only reasonable, but it is quite low, as that number does not represent near one-half the delegate ratio strength of the American profession. One of the good things about these jottings is a knowledge of the fact that our friends in Detroit are making their preparations on an elaborate scale. More than four thousand can be entertained and cared for as gentlemen should be on such an occasion.

COMBINATIONS OF MEDICAL MEN.

Even the worm will turn against the heel that crushes it, and even medical men are beginning to demand some just recognition. The recent attempt in Arkansas by the medical men of a small community to protect themselves from imposition by notifying each other of the individuals who made unremunerative patients is an index of the feeling which is beginning to pervade the profession, and the action of the citizens of that community in organizing to boycott these physicians for doing that which every merchant does when he becomes a subscriber to a commercial agency, shows only too clearly how like slaves

the profession is regarded by a certain portion of the community.

Certainly it is true, that the profession as a whole is punctiliously mindful of the dictates of humanity. So true is this that a single slip in this direction by a physician, even if his action be within the bounds of strict right and justice, at once calls for loud complaints from the laity. The community has grown to judge us by altogether different standards from those which it employs in its judgment of others. When the physicians of Findlay, O., during an epidemic raised their fees from the modest sum of one dollar a visit to the still modest and inadequate sum of one dollar and a half a visit, the whole country was notified of their barbarity, by the inconsistent people of that town, who but a few short months before had flocked there for purposes of speculation, and who had held farms and "town" lots at enormous figures because they could, and who had not hesitated to receive such sums for their land as the "gas boom" brought on, and who took particular pains to close out their deals before the drop came. A recent attempt by the physicians of South Chicago, to form a protective association, led an attorney to announce the remarkable doctrine that physicians being licensed by the State, could not withhold their services when demand for them was made.

It is this same spirit which prevents the profession as a whole from exercising that influence in the community which its knowledge, training and culture should command. The animus which prevents legislation protecting physicians from unjust suits for alleged malpractice, is largely dependent upon this same condition of affairs.

DR. JOHN W. WATSON,¹ in his presidential address before the Northwest of Ireland Branch of the British Medical Association, recalls some very interesting facts. Within the past fifty years, the average duration of life has been increased ten years, largely due, directly and indirectly, to the labors of the medical profession. During this period, the advances in the medical sciences have been unusually great. The benefit of all these advances has been freely given to the people, without money and without price. These very advances in knowledge have thrown additional burdens and responsibilities on medi-

cal practitioners. The medical man of a half century ago was not called upon to make the refined diagnoses which modern science renders possible, and which modern ways demand. No thermometer, or microscope, or laryngoscope, speculum, or hæmometer, or sphygmograph, or any of many other instruments of exact research, demanded his consideration. Yet with all these the modern doctor must work. In making a diagnosis he must spend much more time with his patient than formerly, and to do him justice all around, he must spend much more time with his books and journals. Yet for all this increase of labor, and for the largely increased value of his visit, there is no increase in his remuneration in any way. In fact, there is an actual decrease.

Periodical literature gives evidence that movements are now on foot to secure for our profession the recognition due it.

It is idle to say that the profession receives its dues. Its methods are so out of harmony with the active commercial spirit of the age, that it cannot be understood. No better evidence of this is needed than the persistent misinterpretation of its motives by the daily press on matters relating to quackery. As to its *personnel*, it is actually and relatively superior to day, but does not receive the attention given the pompous doctor of "ye olden time."

To overcome the difficulties, it is necessary to secure the intelligent respect of the community. Increase of scientific knowledge cuts no figure in such a programme. Science is advancing by giant strides, but these strides can not be appreciated by those who can not understand them in detail. The means to secure respect, must be such as universally command respect to-day; and here we must take a lesson from our commercial brethren. An able financier has said that the keynote to modern success is "combination." The immense power of the great moneyed corporations is not due solely to their financial soundness, but partly also to the great number of individuals interested in them. The success of the great "trusts" proves the value of combination. The so-called "labor element" has found the value of combination.

In Great Britain and Ireland the physicians have combined in the great British Medical Association. The weekly issue of its journal now exceeds 17,500. This combination is not as well

¹ Provincial Medical Journal, Vol. x, p. 716.

organized as it should be, and will be in the future, nevertheless its influence is great, and its will, as expressed by its powerful journal, has during the past year secured at least two great reforms; the one was the frustration of the intention of the Government to abolish the class of factory surgeons, and the other was the practical and successful enforcement of the claims of the army surgeons to improvement in title, rank, and sick leave. It has now undertaken the redressal of the wrongs of the Irish dispensary doctors.

The American profession has in the American Medical Association an organization which can accomplish as much for them, if they will support it. But instead of a membership of 6000, it should have a membership of 60,000. With such a combination, the American profession would command respect, and carry conviction by its very weight. It is not to be supposed that such an organization would please everybody. Perhaps in its details it would please nobody. But in general its influence would be for the benefit of all, on broad lines.

Here is the opportunity before the profession. Will it take advantage of it?

LA GRIPPE.

This serious affection, that is at this time numbering its victims by the thousand, and proving fatal in many instances, has had a most singular career. Its first appearance in this country, two years ago, was heralded through the secular press with cheap wit and ridicule. All the same, its presence was made manifest in the aching bones, nervous prostration, painful muscles and distressed breathing of multitudes of people. A few succumbed to the first onset of the disease; others suffered from sequelæ which had a fatal termination, while a still greater number recovered very slowly, and others experienced a nervous prostration that will cling to them through life.

In the treatment of la grippe, the first most necessary thing is to require the patient to go to bed, and to there remain until convalescence is assuredly established. A nutritious diet of easy digestion, eggnog and red wines, strychnine, quinine and sedatives are indicated. Small doses of calomel and bicarbonate of soda rubbed

up with a little sugar of milk, to excite the glandular functions and keep the alimentary canal freely open, with rest of body and mind, is the course of treatment. We know of no specific remedy for this extremely serious but much ridiculed malady.

LABIAL CHANCER FROM AN UNUSUAL SOURCE.

—Dr. Moses Kleiner, of Denver, has reported the case of a servant maid who contracted a primary lesion, in consequence of applying vaseline to her chapped lips, which vaseline was taken from a pot or bottle belonging to a male boarder. The latter was the subject of a chancre of the penis and had been using the vaseline to annoint the part. The full account of the case may be found in the *Medical Record*, Sept. 12.

ARSENITE OF COPPER IN BOWEL TROUBLES.

—Dr. Z. P. Laudrum (*Med Summary*) speaks as follows in favor of this remedy: Our experience with the arsenite of copper has been both satisfactory and assuring. We have used it in more than sixty cases of bowel disorders during the last two years without its disappointing us in one single instance. We give it in suitable cases with more confidence than we give quinine for chills. It is especially valuable in the treatment of the summer complaints of children, in the chronic disorders of which the stomach is involved to the extent of almost constant nausea.

In every case of gonorrhœa warn your patient of the danger of conveying the disease to the eyes by the fingers, and of the fearful results of gonorrhœal ophthalmia.

SNEEZING favors the expulsion of the child in a case of labor, hence the use of tobacco, snuff or pepper, or other substances that will bring on the paroxysm by irritating the Schneiderian membrane, will hasten a tardy delivery.

NITRO-GLYCERIN FOR ASPHYXIA.—In a case of asphyxia from the inhalation of illuminating gas, Hoffmann (*Allgem. Med. Ztg.*) succeeded in relieving the symptoms by the subcutaneous administration of nitro-glycerin in doses of a hundredth of a grain. The injection was made in the precordial region, and was followed by marvelously prompt results.

AN EPIDEMIC OF TUBERCULOSIS.—An epidemic of tuberculosis has broken out in the electrical workshops at Paris. Out of thirty-five workmen thirty-two are consumptive. Twenty-three have become so since entering the workshops.

FOR cold in the head, there is no better remedy than gelsemium. One good, large dose, say ten minims of the fluid extract, taken upon going to bed, will effectually dispose of this troublesome and uncomfortable affection. One dose is usually sufficient.—*Med. Summary.*

A NUMBER of cases of chorea have been reported as cured by the use of iodide of potassium. It is undoubtedly that class of cases in which there is a blood discrasia. One grain in solution is given three or four times a day to a child.

POULET, in the treatment of epilepsy advises tincture of Calabar bean with bromide of potassium. In five obstinate cases which were treated with bromide of potassium without results, a cure was accomplished with the addition of Calabar bean.

SCHLEICH advises the internal use of the iodide of potassium to assist in the granulation of deep wounds. The wounds quickly assume a more healthy appearance. The granulations increase rapidly, and the period of healing is greatly shortened.

IF pulverized ipecac in water be applied freely to a surface poisoned by rhus, the pain, itching and heat will be immediately relieved, and a cure quickly follows.

TO ARREST the secretion of milk the external application of one part of camphor in six parts of oil of turpentine is often of great service.—*Medical Record.*

STRYCHNINE FOR DRUNKENNESS.—In consequence of the remarkable success claimed in the treatment of drunkenness with hypodermic injections of strychnine, this method of treatment was tried in the city hospital in Görlitz, Silesia, but the results were almost entirely negative.—*Boston Medical Journal.*

BOOK REVIEWS.

A PRACTICAL TREATISE ON THE DISEASES OF WOMEN. By T. GAILLARD THOMAS, M.D., LL.D., emeritus professor of diseases of women in the College of Physicians and Surgeons, New York, and PAUL F. MUNDÉ, M.D., professor of gynecology in the New York Polyclinic. New (sixth) edition, thoroughly revised and rewritten by Dr. Mundé. In one large and handsome octavo volume of 824 pages, with 347 illustrations. Cloth, \$5.00; leather, \$6.00. Philadelphia: Lea Brothers & Co., publishers. 1891.

This truly great work, so well known to every gynecologist, has long since passed beyond the domain of criticism by THE JOURNAL reviewer. This new edition comes to us fresh from the hands of its talented authors, bearing on its pages the well-known presentations of former editions, to which have been added a sound judgment happily expressed of the new work in this field during the last few years. The work of revision

being done by Dr. Mundé. In fact, he has done his work so well that his name properly appears as joint author. The list of illustrations has been greatly increased in number, and enriched by a beautiful series of accurate drawings, photographically reproduced. The book is destined in its new form to maintain its position, and nothing more effective could be said in its praise.

REVIEW OF ESSENTIALS OF NERVOUS DISEASES AND INSANITY. By JOHN C. SHAW, M.D. Published by W. B. Saunders, Philadelphia.

This little quiz compend is spottedly good, fair and defective, and as a compend is certainly not compendious, for very many nervous and mental diseases are omitted, and seldom encountered disorders, such as Morvan's disease, are included.

The classification of insanity is decidedly wrong. For instance, senile dementia he places under the head of a simple insanity not connected with degenerative neuropathic states, and then proceeds to say: "It is the result of physical changes in the brain, atheroma, endarteritis and periarteritis; general disturbances in nutrition, localized atrophies, together with the changes in the other organs found in senility."

In respect to such nervous diseases as the author has had experience with, his descriptions are very good.

EPIDEMIC INFLUENZA; Notes on its Origin and Method of Spread. By RICHARD SISLEY, M.D. London: Longmans, Green & Co. For sale by A. C. McClurg & Co., Chicago. Price, \$2.50.

This monograph is timely in its appearance, as there is a very general prevalence of the disease in many parts of our country, and particularly in the more populous centres.

The author gives a very satisfactory nomenclature of influenza, its definition, the origin, and spread of the disease by contagion, with a history of the several epidemics which have prevailed.

A TEXT BOOK ON PRACTICAL THERAPEUTICS, with especial reference to the application of remedial measures to disease. By HOBART AMORY HARE, M.D. Second edition. Enlarged and thoroughly revised.

We are much gratified at the receipt of this new edition of Dr. Hare's work on Therapeutics. While there was very much in the first edition deserving of criticism, showing as it did a degree of undue haste in preparation, the author has been at pains to eliminate many imperfections and now presents the medical profession with a work that is deserving of commendation. The latest knowledge pertaining to new remedies is introduced, including the method of employing the rest cure, and the use of suspension in the treatment of locomotor ataxia and kindred affections.

THE PHYSICIAN'S VISITING LIST, Lindsay & Blakiston.

This is a long time favorite with many thousand physicians.

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NECROLOGY.

WASHINGTON F. PECK, A.M., M.D., of Davenport, Ia., died December 12, 1891, in his fifty-first year. He was a native of Galen, N. Y., and a graduate of Bellevue Hospital Medical College. He was *interne* at Charity and Bellevue for eighteen months, and at Lincoln Hospital, Washington, for a year, before settling permanently for practice at Davenport. He was chosen President of the State Medical Society in 1876, professor of surgery in the medical department of Iowa State University, and Dean of Faculty from 1869. He was surgeon-in-chief of the Rock Island Railroad from 1875, surgeon to Mercy Hospital, Davenport, and consulting surgeon to the Mercy Hospital, Iowa City. He was chairman of the Surgical Section of the American Medical Association in 1883, and delegate therefrom to two International Congresses. He was surgeon of the Iowa Soldiers' Orphan Home, and prominent in other local charities and in life insurance matters. He was a man of originally strong physique, much endurance, a strength of purpose and reliance that seemed to destine him to a long and meritorious leadership in every professional and social department which obtained his interest and attention.

SURGEON M. L. RUTH, of the Navy, died at Brooklyn on the 13th inst., in his forty-seventh year. He was one of the best known of the naval staff, especially from his being the means of saving the life of the present Secretary of the Navy, when the home of the latter was destroyed by fire and two members of his family lost their lives. The impairment of Dr. Ruth's health during a year past, led him about three months ago to resort for treatment to the Naval Hospital at Brooklyn, and he there succumbed to complications of cardiac and renal disease.

SELECTIONS.

FETID FEET.—The cause of this unpleasant ailment is to be found in the unnatural custom of wearing shoes. Nature contemplated a shoeless animal when she made man, and she so arranged the epithelium on the soles of his feet as to provide for a rapid reproduction of the layers worn off in walking. So well suited to man's necessities was this arrangement, that Parkes, after discussing the merits of various foot-gear, concludes that the best shoe for soldiers is no shoe at all. But man had to improve on nature, and the way he has done it is by encasing the foot in an impermeable casing of tanned leather. This prevents the removal of the epithelium from the sole, and also prevents the escape of perspiration, which, keeping the dead epithelium moist, infallibly renders it odorous.

The reason why washing does not relieve this is, that soap and water alone are insufficient to remove the epithelium. No amount of rubbing will do this; and it is doubtful if anything short of a vigorously wielded

scrubbing brush will do so. But the Greeks had something better even than this. Some of our readers will remember the description given by Xenophon of the games instituted by Cyrus, before his march to the field of Cunaxa, and that among the prizes given to the victors were "golden-flesh scrapers." Not even a brush equals in efficiency the scraping with some metallic instrument, like a dull paper-cutter.

We would recommend, therefore, for fetid feet, that the sufferer should soak the feet in hot water, and scrape them well, every night, until the nuisance is abated; and to keep this up weekly thereafter, with morning ablutions of cold water with no soap, but followed by vigorous rubbing with a course towel. This is better than all the salicylated powders or ointment.—*Times and Register*.

SLEEP is "nature's balmy restorer." The old saw, "six hours for the wise and eight for children and fools," is nonsense. During growth, proper physical development, especially of the brain, demands plenty of sleep; and the more nervous or precocious the child, the more sleep should be the rule. If not, we may expect premature death, or an early and too intellectual growth. Until the fifteenth year is reached, there should be ten hours' sleep; from 15 to 20, nine hours, and after maturity, while each may judge for himself, eight hours is a good rule. Plenty of refreshing sleep will prevent more nervous derangements than medicine will cure.—*Kansas Med. Journal*.

MISCELLANY.

AT THE meeting of the American Medical Association in 1892, the work of the Section on State Medicine will be arranged as follows:

The first day will be given to the address of the chairman and the report of the committee on "School Hygiene." As this committee will make its final report, the entire session, after the chairman's address and the necessary routine business, will be devoted to its discussion.

The second day will be devoted to the discussion of the "Pollution of Rivers and Inland Streams, its effect upon Public Health, and Measures for its Prevention." An effort will be made to have this subject handled from every possible point of view. Members of the Association who have given study to the subject will kindly prepare papers, and notify the Secretary of the titles of these papers.

The third day will be given to miscellaneous papers. Members desiring to read papers on this day will kindly send in titles. Respectfully,

LAWRENCE F. FLICK,
Sec'y of Section on State Medicine.
736 Pine St., Philadelphia.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from December 12, 1891, to December 18, 1891.

By direction of the Acting Secretary of War, a board of medical officers, to consist of Col. Bernard J. D. Irwin, Surgeon; Lieut.-Col. Charles H. Alden, Surgeon; Major Alfred C. Girard, Surgeon; First Lieut. Alfred E. Bradley, Asst. Surgeon, is constituted, to meet at Hdqrs. Dept. of the Missouri, Chicago, Ill., on the 1st day of February, 1892, for the examination of candidates for admission to the Medical Corps of the Army, and for such other business as the Surgeon-General may desire to bring before it.

Capt. Edgar A. Mearns, Asst. Surgeon, so much of par. 1, S. O. 265, A. G. O., as directs him to report to the commanding officer, Ft. Mackinac, Mich., is revoked; he will proceed to El Paso, Tex., and on arrival there, report for duty to Lieut.-Col. John W. Barlow, Corps of Engineers, member of the commission appointed for the location and marking of the boundary between Mexico and the United States. By direction of the Acting Secretary of War.

First Lieut. Philip G. Wales, Asst. Surgeon U. S. A., granted leave of absence for one month, with permission to apply for an extension of one month.

List of Permanent Members of the American Medical Association,

AND SUBSCRIBERS TO THE
JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

SUBSCRIBERS NAMES ARE DESIGNATED BY THE LETTER S.

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Caldwell, Groves, James P. O. 1889
Camp, Erasmus T., Gadsden 1890
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Cochrane, J., Montgomery 1884
Collins, Jas. A., Warrior S
Conyngton, E. J., New Decatur 1890
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Cross, Benj. F., Decatur 1890
Davis, W. E. B., Birmingham 1885
Desprez, L. W., Russellville 1890
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Goodwin, Albert, Eufala 1885
Goodwin, J. A., Jasper 1891
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Ketchum, Geo. A., Mobile 1880
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Rountree, S. L., Hartsell's 1890
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Sanders, W. H., Mobile 1890
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ALASKA.

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ARKANSAS.

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Dibrell, J. A., Little Rock 1875
Dunlap, A., Winslow 1885
Ewing, D. C., Batesville 1880
Floyd, R. G., Eureka Springs 1877

Gaines, Jno H., Hot Springs 1885
Gibson, L. P., Little Rock 1890
Goodwin, B. C., Marvell 1885
Gray, C. S., Fayetteville 1890
Guthrie, A., Jr., Quitman 1875
Hooper, P. O., Little Rock 1885
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Hurley, T. W., Bentonville 1882
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Kellar, J. M., Hot Springs 1879
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Orto, Z., Pine Bluff 1885
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Shibley, J. S., Paris 1885
Vance, A. J., Harrison 1882
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Welch, W. B., Fayetteville 1891
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CALIFORNIA.

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Baird, C. L., San Buenaventure 1887
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Brown, W. C., Los Angeles S
Butin, John L., Madera 1886
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Curtess, Wm., Truchee S
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Dial, E. A., Long Beach 1885
Fenn, C. M., San Diego 1873
Ferguson, R. A., Bakersfield 1890
Hare, Geo. A., Fresno 1890
Harrison, W., Los Angeles 1877
Hatch, F. W., Sacramento 1873
Hess, L. P., Oakland 1882
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Kengla, L. A., San Francisco S
Kierulff, B. F., Los Angeles 1882
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Lewis, D. M., Los Angeles S
Liliencrantz, A., San Francisco S
McAllister, W. L., Pasadena 1886
McNutt, W. F., San Francisco 1882
Maughs, G. M. B., Pomona 1890
Maynard, H. H., Los Angeles 1889
Miller, J. H., Redding 1889
Miller, Robt., Los Angeles 1890
Newkirk, A. B., Los Angeles S
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Orme, H. S., Los Angeles 1882
Parkerton, I. H., Oakland 1884
Parkinson, J. H., Sacramento 1882
Paulding, O. P., Templeton 1884
Payne, F. H., Berkley 1871
Payton, D., Stockton 1885
Plummer, R. H., San Francisco 1890
Potter, S. O. L., San Francisco 1890
Remondino, P. C., San Diego 1890
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Rogers, C. A., Bakersfield S
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Stewart, J. T., Monrovia 1885
Stuart, A. McG., Santa Rosa 1889
Sundberg, J. C., San Francisco 1891
Taylor, W. E., San Francisco 1890
Thayer, J. W., Gilroy 1870
Thorne, Wm., San Diego 1879
Todd, F. W., Los Angeles 1881
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White, Geo. A., Sacramento 1882
Woolsey, E. H., Oakland 1882
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CANADA.

Alexander, R. A., Grimsby, Ont 1891
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Ont. Med. Lib. Ass'n, Toronto S
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CHEROKEE NATION.

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Arnold, W. W., Colorado Springs 1889
Baue, Wm. C., Denver 1874
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Brown, Geo. E., Las Animas 1877
Bucknum, A. M., Denver 1883
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Cooke, Theo., Colorado Springs S
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Crandall, W. C., Denver
 Craue, Francis J., Denver
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 Denver Public Library, Denver. S
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 Dodds, J. C., Denver S
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 Graham, J. W., Denver 1886
 Grant, W. W., Denver 1873
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 Hawes, Jesse, Greeley 1882
 Hawkins, T. H., Denver 1886
 Horn, Thos. G., Colorado Springs 1890
 Levy, Robert, Denver 1889
 McDermith, S. T., Denver 1881
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 Steele, H. K., Denver 1888
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CONNECTICUT.

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 Barnes, L., Oxford 1883
 Bill, C. H., Bridgeport 1883
 Bishop, T. H., New Haven 1847
 Braiman, F. M., New London 1884
 Brayton, Chas. E., Stonington 1889
 Buckley, L. S., Stamford S
 Burns, Edward, New Britain S
 Card, E. D. C., Willimantic S
 Carrington, Chas., Farmington 1872
 Castle, F. E., Waterbury 1880
 Clary, Geo., New Britain S
 Clemens, A., Bridgeport S
 Coholan, M. J., New Britain S
 Crandall, H. C., Bridgeport S
 Crossfield, F. S., Hartford 1889
 Crothers, Thos. D., Hartford 1888
 Cummings, B. H., New Britain S
 Cummings, Willis, Bridgeport 1890
 Davis, E. H., Plainfield 1884
 Davis, G. P., Hartford 1880
 Day, Loren T., Westport S
 Delesdemier, H. N., Meriden S
 Dever, J. H., Bridgeport S
 Donahoe, M. J., Waterbury S
 Douglas, A. T., New London S
 Dontell, W., New Britain S
 Dunham, M. V. B., Greenfield Hill 1891
 Eastman, C. A., Middletown 1890
 Elliott, G., New Haven 1884
 Fitzgerald, E., Bridgeport S
 Fleischner, H., New Haven 1888
 Fox, Chas. J., Willimantic 1880
 Fox, Edward G., Wethersfield 1889
 Frost, C. W. S., Waterbury S
 Fuller, F. B. J., Norwich S
 Fuller, H. S., Hartford 1884
 Garlick, S. M., Bridgeport 1891
 Godfrey, Chas. C., Bridgeport 1889
 Gordon, Jas. W., Bridgeport S
 Graves, F. C., Bridgeport S
 Gregory, J. G., Norwalk S
 Gregory, E. P., Waterbury S
 Hall, M. W., Bridgeport S
 Harriman, P. H., Norwich S
 Hayes, J. F., Waterbury S
 Hill, Edwin A., E. Killingly 1864
 Hills, T. M., Willimantic 1870
 Hughes, O. J., Meriden S
 Huntington, S. H., Norwalk S
 Jarvis, Geo. C., Hartford 1872
 Kent, J. B., Putnam 1890
 Kinney, F. C., Norwich 1880
 Knight, Geo. H., Lakeville 1881
 Lander, Robert, Bridgeport S
 Le Moyne, F., New London 1883
 Lindsley, Chas. A., New Haven 1884
 Lopez, Ralph, Waterbury S
 Luscomb, A., Waterbury S
 McFarland, D. W., Waterbury S
 McManus, Jas., Hartford 1889
 Mason, L. D., Greenwich 1870
 Moody, M. B., New Haven 1889
 Murphy, M. D., Middletown S
 Nelson, A. W., New London 1888
 North, Alfred, Waterbury 1866
 O'Hara, B., Waterbury S
 Paddock, L. S., Norwich S

Parker, F. R., Willimantic S
 Peckham, L. C., New Haven 1891
 Phillips, R. G., Stamford S
 Pierce, F. C., Willimantic S
 Pinney, Chas. H., Derby 1875
 Porter, Geo. L., Bridgeport 1880
 Prior, D., Stamford S
 Robbins, G. O., Waterbury S
 Root, Jos. E., Hartford 1889
 Ryce, B. P., Meriden S
 Segur, Gideon C., Hartford S
 Shelton, G. A., Shelton 1880
 Shove, H. W., Woodbury S
 Shepherd, G. R., Hartford 1881
 Smith, F. L., Bridgeport S
 Smith, Herbert E., New Haven S
 Snow, E. E., Danbury S
 Stanton, J. G., New London S
 Stone, J. S., New Britain S
 Stratton, E. A., Danbury S
 Swasy, E., New Britain 1880
 Tillinghast, F. A., Norwich S
 Tracy, Wm. J., Norwalk S
 Turner, S. W., Chester 1880
 Upson, C. R., Waterbury S
 Wainwright, W. A., Hartford 1873
 Ward, C. A., Waterbury S
 Watt, Andrew, Bridgeport S
 Welch, Edward H., West Winsted 1889
 Welch, W. W., Norfolk 1889
 Werner, S., Waterbury S
 Wheeler, F. H., New Haven S
 Whittemore, F. H., New Haven 1884
 Wile, W. C., Danbury 1882
 Witter, Wm., Norwich 1889
 Wood, E. H., Bridgeport S
 Wordin, N. E., Bridgeport S
 Wray, Geo. B., Bridgeport S
 Young, F. G., Bridgeport 1884

DAKOTA.

Archibald, O. W., Jamestown 1878
 Baker, B., Deadwood 1884
 Capehart, H., Fargo 1891
 Christison, J. S., Dell Rapids S
 Coyne, S. J., Aberdeen 1890
 Crain, F. M., Doland 1886
 Darrow, E. M., Fargo 1887
 Dickinson, D. K., Lead City 1885
 Dun an, W. E., Aberdeen S
 Edgerton, W. E., Salem S
 Frazer, W. E., Bismark 1884
 Freeman, J. W., Lead City 1885
 Gilbert, J. C., Wessington S
 Kaull, W. M., Watertown 1883
 Kutnewsky, J. K., Redfield 1890
 Logan, J. R., Grand Forks 1891
 McConnell, J. D., Fargo S
 Rankin, Jas. A., Jamestown S
 Shaw, A., Watertown 1891
 Spooner, J. R., Lake Preston S
 Wean, I. N., Fargo 1886
 Wentworth, S. S., Cresbard 1885

DELAWARE.

Burton, H. R., Lewes 1891
 Bush, L. P., Wilmington 1847
 Collins, S. B., Seaford 1883
 Ellegood, Robt. G., Concord 1880
 Hopkins, Jas. A., Milton 1891
 McKay, R. J., Wilmington S
 Marshall, Wm., Milford S
 Richards, C. H., Georgetown 1879
 Stewart, F. E., Wilmington 1882
 Wilson, J. H., Dover 1891

DISTRICT OF COLUMBIA.

Acker, G. N., Washington 1881
 Adams, B. B., Washington 1891
 Adams, S. S., Washington 1881
 Austin, H. W., Washington 1881
 Barker, H. H., Washington 1872
 Beardsley, G. S., Washington 1891
 Behrend, A., Washington 1891
 Belt, E. O., Washington 1891
 Bidwell, W. D., Washington S
 Bllings, J. S., Washington 1868
 Boarman, C. V., Washington 1884
 Boehmer, Geo., Washington S
 Bovee, J. Wesley, Washington 1891
 Bowen, C. H., Washington 1891
 Briscoe, W. C., Washington 1884
 Bromwell, J. R., Washington 1884
 Brown, C. W., Washington 1876
 Brown, J. M., U. S. N., Washington 1881

Bruckheimer, M., Washington 1891
 Brumbaugh, G. M., Washington 1891
 Bryan, J. H., Washington 1889
 Bulkley, J. W., Washington 1878
 Burton, G. C., Washington 1891
 Burwell, J. P., Washington 1891
 Busey, S. C., Washington 1870
 Byrnes, W. I., Washington 1891
 Byrns, W. F., Washington S
 Carroll, J. M., Washington 1891
 Chamberlin, F. F., Washington 1891
 Chappell, J. W., Tennallytown S
 Cook, G. W., Washington 1887
 Cotterell, J. F., Washington 1881
 Crook, H., Washington 1891
 Deale, Henry B., Washington 1891
 Dexter, J. E., Washington 1891
 Dist. of Col. Heal'h Dep't, Washington S
 Donally, W. M., Washington 1891
 Donohue, F., Washington 1891
 Eliot, L., Washington 1891
 Evans, W., Washington 1870
 Fenwick, G. P., Washington 1891
 Flint, J. M., Washington 1878
 Foster, W. W., Washington 1884
 Fox, W. H., Washington 1884
 Franzoni, C. W., Washington 1872
 Friedrich, L. L., Washington 1891
 Fry, H. D., Washington 1884
 Geddings, H. D., Washington 1891
 Gobrecht, W. H., Washington 1858
 Godding, W. W., Washington 1884
 Gunnell, F. M., Washington 1876
 Hagner, D. R., Washington 1884
 Hammond, T. V., Washington 1890
 Hance, T. F., Washington 1891
 Handy, W. E., Washington 1891
 Harrison, G. B., Washington 1884
 Hausmann, Theo., Washington S
 Hawkes, W. H., Washington S
 Hazen, David H., Washington 1889
 Heger, A., U. S. A., Washington 1891
 Henderson, G., Washington 1891
 Hill, R. S., Washington 1891
 Holden, R. T., Washington 1884
 Howard, J. T., Washington 1891
 Hyatt, Frank, Washington 1881
 Johnson, H. L. E., Washington 1884
 Johnson, J. T., Washington 1876
 Johnston, W. W., Washington 1884
 Jones, A. W., Washington 1891
 King, A. F. A., Washington 1881
 Kleinschmidt, C. H. A., Washington 1880
 Lamb, D. S., Washington 1889
 Lee, Wm., Washington 1886
 Lincoln, N. S., Washington 1876
 Lovejoy, J. W. H., Washington 1864
 McArdle, T. E., Washington 1884
 McGuire, J. C., Washington 1891
 McKim, J. D., Washington S
 Mackall, L., Georgetown 1884
 Mackall, L., Jr., Washington 1890
 Magruder, G. L., Washington 1880
 Marmion, W. V., Washington 1880
 Mason, J. E., Washington 1884
 Mead, Theo., Washington 1889
 Moran, J. F., Washington 1890
 Morgan, Jas. D., Washington 1889
 Muncaster, M., Washington 1891
 Mundell, J. H., Washington R
 Murphy, P. J., Washington 1884
 Neale, R. A., Washington 1891
 Newman, H. M., Washington 1891
 Norton, Thos. M., Washington 1889
 Ober, Geo. C., Washington 1888
 Orleman, Daisy M., Washington S
 Palmer, G. S., Washington 1854
 Parsons, Mary, Washington 1891
 Patterson, DeWitt C., Washington 1881
 Pool, B. G., Washington 1891
 Porter, H. N., Washington S
 Prentiss, D. W., Washington 1830
 Pyles, R. H., Anacostia 1889
 Rawlins, J. W., Washington 1884
 Reyburn, Robt., Washington 1868
 Richardson, C. W., Washington 1889
 Richey, S. O., Washington 1877
 Ritclie, Lewis W., Georgetown S
 Rixey, P. M., Washington 1891
 Rosse, I. C., Washington 1888
 Rush, E. R., Washington 1891
 Sellhausen, E. A., Washington 1891
 Sherwood, T. H., Washington S
 Shively, J. W., Washington 1881
 Shute, D. K., Washington 1891
 Smith, T. C., Washington 1884
 Sothoron, Jas. T., Washington 1889
 Sowers, Z. T., Washington 1887
 Sprigg, W. M., Washington 1891
 Sternberg, G. M., Washington S
 Stone, Isaac, Washington 1885

Stone, T. R., Washington	1891
Stoutenburgh, W. H., Washington	S
Strickler, M. B., Washington	1884
Suter, H., Washington	1889
Thompson, J. F., Washington	1881
Toner, J. M., Washington	1864
Varnell, J. H., Georgetown	
Walsh, Ralph, Washington	1870
West, G. W., Washington	1881
White, R. H., U. S. A., Washington	1891
Winter, John T., Washington	1889
Witman, H. O., Washington	1891
Wolfhaupter, D. P., Washington	1891
Wolverton, T., U. S. Navy, Washington	1837
Woodward, Wm. C., Washington	S
Wyman, W., U. S. M. H. S., Washington	1884
Yarrow, H. C., Washington	1891
Young, J. T., Washington	1891

FLORIDA.

Anderson, W. E., Pensacola	1891
Belton, G. W., Tallahassee	
Burroughs, R. B., Jacksonville	1886
Caldwell, F. H., Sanford	1890
Center, G. F., Jacksonville	
DeLong, W. H., Emporia	1884
Fordham, W. F., Pensacola	1890
Hargis, R. W., Pensacola	1891
Jackson, John H., Tampa	
Lancaster, R. A., Gainesville	1885
Moore, W. L., Tallahassee	
Murray, R. D., Key West	1872
Oglesby, C. R., Pensacola	
Renshaw, F. G., Pensacola	S
Ross, J. W., Pensacola	1890
Sabal, E. T., Jacksonville	1875
Stransz, P. H., Palatka	1890
Stringer, S., Brooksville	1890
Tyng, A. E., Chaseville	1877
Wall, J. P., Tampa	1879
Weedon, Leslie W., Tampa	1890
Worcester, O. E., Conant	1890
Wright, O. S., Plant City	1891

FOREIGN.

Caldwell, W. S., Paris, France	
Clausen, Libreria Carlo, Torino, Italy	S
Cochran, E. G., Silao, Mexico	1889
Delaney, J. O. F., Paris, France	1880
Givet, Beugnier-Corbeau, Ardennes, France	S
Graff, Harold, Kristiania, Norway	1890
Hartigan, J. F., U. S. Consul, Trieste, Austria	1884
Jones, Thos. R., Pekin, China	S
LeSoudier, M. H., Paris, France	S
McDill, J. R., Berlin, Germany	1887
Reboul, Mons., Marseilles, France	S
Richards, John M., London, Eng.	S
Royal College of Surgeons, London, Eng.	S
Shrigley, Westcott & Co., Santiago, Chili	S
Swartz, H. W., Hirosaki, Aomaori Ken, Japan	S

GEORGIA.

Armstrong, W. S., Atlanta	1870
Bailey, J. W., Gainesville	1878
Batvey, Robt., Rome	1875
Bullard, W. L., Columbus	1890
Campbell, F. H., Augusta	1870
Coleman, J. S., Augusta	1880
Connolly, E. L., Atlanta	1879
Cortelyou, P. R., Marietta	1887
Cotter, R. O., Macon	1890
Dekl, Thos. S., Thomasville	1887
Doughty, W. H., Augusta	1890
Dunwoody, John A., Brunswick	1889
Elkin, W. S., Atlanta	1891
Foster, Eugene, Augusta	1887
Gaston, J. McF., Atlanta	1886
Goodrich, E. C., Augusta	1880
Goss, I. H., Athens	1888
Grimes, Geo. J., Columbus	1879
Hallis, T. B., Bolinbrooke	
Hardin, R. A., Savannah	1884
Hardman, L. G., Harmony Grove	1883
Hawkins, S. B., Americus	1884
Holmes, J. B. S., Rome	1889
Holt, Wm. F., Macon	1879
Hookins, J. G., Thomasville	1890
Hopkins, T. S., Thomasville	1875
Hoyt, W. D., Rome	1879
Huzza, Thos. H., Atlanta	1890
Jenkins, R. H., Hogansville	1880

Kime, R. R., Atlanta	1886
Lamb, T., Augusta	1885
Logan, A. J., Americus	1884
McHattan, H. M., Macon	1884
McIntosh, T. W., Thomasville	1885
Martin, J. D., Savannah	1880
Middlebrooks, J. D., Brownsville	S
Munn, R. J., Savannah	
Musen, R. J., Savannah	
National Surgical Institute, Atlanta	S
Nicholson, Wm. P., Atlanta	1889
O'Daniel, W., Bullard's Station	1879
Powell, T. O., Milledgeville	1879
Quillian, D. D., Athens	S
Richardson, E. H., Atlanta	1885
Rowland, A. A., Brunswick	1877
Smith, J. E. W., Waycross	1885
Stevens, A. C., Danielsville	
Stockton, F. O., Atlanta	1877
Sykes, T. J., McNutt	S
Thompson, P. H., Bluffton	1891
Wood, Wm. E., Monroe	1891

IDAHO.

Givens, J. W., Blackfoot	S
Silva, C. C. P., Mountain Home	1886
Woodhull, A. A., U. S. A., Ft. Sherman	1890

ILLINOIS.

Adolphus, P., Chicago	1884
Akins, W. T., Chicago	1887
Alderson, J. J., Chicago	1887
Allison, W. R., Good Hope	1888
Allport, W. W., Chicago	1881
Anderson, Bennet C., Beardstown	1890
Anderson, Robt. S., Grove City	S
Andrews, E., Chicago	1851
Armstrong, C., Carrollton	1886
Auld, J. Maxwell, Chicago	1887
Avery, S. J., Chicago	
Babcock, Robt. H., Chicago	1887
Bacon, C. S., Chicago	
Bailey, W. G., Pekin	
Bain, W. H., Springfield	1890
Baker, L. H., Oak Park	1873
Baldwin, A. E., Chicago	1886
Banga, H., Chicago	S
Banta, C., Eureka	S
Barger, R. N., Hopedale	1884
Barlow, L. N., Chicago	1887
Barnes, I. N., Decatur	1887
Barrett, W. M., Onarga	1887
Bartlett, A. T., Verden	1890
Bartlett, J., Chicago	1887
Barton, P. H., Danville	1883
Bassett, M. F., Quincy	1864
Beadle, C. H., Chicago	S
Beebe, E. W., Elizabeth	
Behrens, M. B., Chicago	1888
Belfield, W. T., Chicago	
Bell, J. F., Elgin	S
Bemis, J. G., Chicago	S
Bennett, I. E., Plano	1883
Bennett, R. T., Elgin	S
Berkebile, J. K., Millstadt	1879
Berry, J. G., Chicago	1887
Besharian, J. H., Chicago	1884
Best, J. E., Arlington Heights	1887
Bettman, B., Chicago	1887
Biddle, J., Monmouth	1886
Billings, F., Chicago	1884
Bishop, S. S., Chicago	1885
Boal, Robert, Peoria	1887
Booth, David S., Belleville	1876
Borbeck, A. C., Wellington	1891
Bouffleur, A. I., Chicago	1891
Bowers, L. S., Chicago	S
Braffet, Jas. H., Paw Paw	
Brant, I. L., Tower Hill	
Brayton, S. H., Evanston	S
Brenneman, W. E., Columbus	S
Bridge, W. C., Elgin	S
Brinkerhoff, W. C., Chicago	S
Brophy, J. W., Chicago	1881
Brower, D. R., Chicago	1877
Brown, E. V., Burnside	S
Brown, H. B., Lincoln	1887
Brown, Jas. L., Peoria	1888
Brown, L. G., Rockford	S
Buck, H. B., Springfield	1876
Burlingame, D. V., Elgin	S
Burnham, A. F., Ashland	1886
Burnett, Mary W., Chicago	S
Burnstead, J. E., Dundee	S
Burr, Albert H., Chicago	S
Burwash, T. N., Plainview	1886
Byford, H. T., Chicago	1874

Caldwell, W. S., Freeport	1887
Campbell, H. E., Clinton	
Campbell, J. Y., Paxton	1882
Carey, F., Chicago	
Carter, J. M. G., Waukegan	1882
Casselberry, W. E., Chicago	1887
Catlin, E. P., Rockford	1884
Chalmers, G. S., Altona	S
Chamberlain, G. M., Chicago	1877
Chapman, G. H., Grand Crossing	1887
Charles, J. E., Chicago	1887
Chenoweth, W. J., Decatur	1872
Chew, J. H., Chicago	1877
Christopher, W. S., Chicago	1888
Clark, C. M., Chicago	
Clarke, W. E., Chicago	1882
Cleveland, E. F., Dundee	1880
Coey, A. J., Chicago	S
Coker, W. W., Hyde Park	1886
Colburn, J. Elliott, Chicago	1887
Cole, N. B., Bloomington	1884
Cole, Samuel, Chicago	
Cole, W. C., Jacksonville	1886
Conley, P. H. B., Chicago	S
Connor, J. J., Pana	1886
Cook, E. P., Mendota	1876
Cook, J. C., Hyde Park	1887
Cooke, A. H., Chicago	1884
Cooper, E. H., Galesburg	S
Corr, A. C., Carlinville	1886
Cowan, J. E., Galesburg	1882
Cox, W. M., Mt. Sterling	1883
Cozad, Jas., Reynolds	1876
Craig, G. G., Rock Island	1878
Crawford, C. E., Rockford	S
Crawford, N. B., Eureka	1890
Croker, J. N., Chicago	S
Crow, J. F., Carrollton	1886
Culbertson, J. C., Chicago	1888
Culhane, T. H., Rockford	S
Cullen, T. F., Chicago	1887
Curtiss, R. M., Union	1890
Dahlberg, A., Chicago	1887
Daler, J. A., Elgin	S
Danforth, I. N., Chicago	1886
Davison, J. B., Moline	1873
Davis, C. G., Chicago	S
Davis, N. S., Chicago	1847
Davis, N. S., Jr., Chicago	1886
Day, W. W., Chicago	1891
Deegan, Wm., Chicago	1891
Deming, H. H., Chicago	
De Veny, S. C., Chicago	1884
Dicuss, Geo. A., Streator	1890
Dieffenbacher, P. L., Havana	1881
Diehl, J. J., Centralia	S
Dimmitt, F. W., Oneida	1888
Dixon, J. N., Springfield	1887
Dodson, J. M., Chicago	1888
Doering, E. J., Chicago	1887
Donis, J. A., Chicago	S
Dougall, Wm., Joliet	1877
Dougherty, P., Chicago	1887
Drew, A. M., Weldon	1886
Du Hadway, C., Jerseyville	1882
Dudley, E. C., Chicago	1883
Dunn, J. Austin, Chicago	1891
Dunning, C. W., Cairo	
Earle, C. A., Desplaines	S
Earle, C. W., Chicago	1882
Eddy, W. J., Shelbyville	1891
Elliott, A. R., Chicago	
Engert, R. H., Chicago	1887
Ensign, W. O., Rutland	1877
Ermine, Lucy E., Chicago	1887
Eskridge, J. H., Chicago	S
Etheridge, J. H., Chicago	1885
Evans, Gus, Chicago	
Ewell, M. D., Chicago	
Eysler, Geo. S., Rock Island	1886
Fenger, C., Chicago	1882
Ferrell, H. V., Cartersville	1886
Fengenbaum, E. W., Edwardsville	1886
Fink, I. W., Hillsboro	1876
Fish, W. H., Baylis	1885
Fiske, G. F., Chicago	1887
Fitch, T. D., Chicago	1884
Fitch, W. H., Rockford	1884
Fitzgerald, F. W., Chicago	S
Foot, D. E., Belvidere	1878
Formanek, F., Chicago	S
Foster, A. H., Chicago	1887
Franklin, W. R., Rockford	S
Fredigke, C. C., Chicago	S
Freeman, J. A., Millington	1882
Fringer, W. R., Pana	1891
Galloway, R., Bloomington	S
Gardiner, Edwin J., Chicago	1889
Gaston, Emma F., Chicago	
German, W. H., Morgan Park	1887
Gibson, R., Alton	S

Gilman, J. E., Chicago	S	Kewley, J. R., Chicago	1887	Ohlmacher, A. P., Chicago	S
Gilson, Oeo. H., Shipman	1887	Kiernan, J. G., Chicago	1888	Ohls, H. G., Hinsdale	S
Goble, E. T., Earlsville		Kilgore, J. C., Monmouth	1882	Owens, John E., Chicago	1877
Godfrey, H. T., Galena	1881	Kinnear, A. H., Henry	1877	Oyler, P. H., Mt. Pulaski	1885
Goldspohn, A., Chicago	1885	Kitchen, J. L., Harvey		Paoli, G. G., Chicago	1863
Goodman, T. B., Cobden	1888	Knight, Mary G., Aurora	1886	Park, A. V., Chicago	1886
Gore, J. R., Chicago	S	Knox, J. S., Chicago	1887	Park, C., Oquawka	S
Gordon, W. A., Chester	1886	Lambert, S. H., Peoria		Parke, C. R., Bloomington	1887
Gorgas, L. D., Chicago	1887	Landon, W. M., Fowler	1886	Parker, G. G., Cairo	1886
Gradle, Henry, Chicago	1887	Laughlin, C. S., Paris	1886	Parker, J. J., Pennington Point	1890
Graham, D. W., Chicago	1886	Lawson, L. F., Chicago	S	Parkhurst, F. J., Danvers	1887
Green, Earl, Mt. Vernon	1886	Leahy, J. J., Lemont	S	Patterson, R. J., Batavia	1876
Green, J. W., Marengo	1887	Leahy, M. M., Chicago	1891	Patton, E. M., Quincy	S
Griffith, B. M., Springfield	1882	LeDuc, E. H., Downer's Grove		Payne, D. A., Chicago	S
Gross, Mrs. S. E., Chicago	S	Ledlie, J. H., Pittsfield	1878	Pearman, J. P., Champaign	1887
Guenther, J., Quincy	1884	Lee, Elmer, Chicago	1886	Pendleton, Milford, Magnolia	1889
Guthrie, H. R., Sparta	1880	Lee, E. W., Chicago	1889	Percy, Jas. F., Galesburg	1887
Guttery, Wm. V., Middletown	1890	Leeds, L. L., Lincoln	1885	Phillips, E. S., Galesburg	1874
Hakanson, H., South Chicago	S	Leland, L. C., Rockford	S	Phillips, W. A., Evanston	S
Hall, G. A., Chicago	S	Leonard, R. L., Chicago	1887	Pitner, J. T., Jacksonville	1872
Hall, J. M., Chicago	1887	Lester, G. B., Oswego	1887	Platt, A. A., Elgin	S
Hall, R. N., Chicago	1887	Lewis, C. J., Chicago	1886	Pleeker, J. H., Chicago	1885
Hallam, J. L., Centralia	1885	Lewis, Denslow, Hyde Park	1886	Plummer, S. C., Rock Island	1873
Hallam, W. L., Bloomington		Lichty, D., Rockford	1873	Plummer, S. C., Jr., Chicago	1887
Haller, F. B., Vandalia	1859	Little, J., Bloomington	1882	Pogue, J., Edwardsville	1887
Haller, J., Lanark	S	Littlefield, H. H., Beardstown	1875	Polk, John L., Arcola	1887
Hamilton, J. B., Chicago	1883	Livingood, Jno. R., Rossville	1883	Pollock, W. L., Heyworth	1882
Hanson, Z. P., Chicago	S	Livorgan, W. D., Chicago	1887	Powell, A. M., Collinsville	1886
Hardy, H. F., Kaneville	1887	Loomis, E. B., Chicago	1887	Pratt, E. H., Chicago	S
Harlan, A. W., Chicago	1884	Lowenthal, Louis, Washington Heights		Priestman, J. L., Neponset	1889
Harmon, H., Chicago	S	Lydston, G. Frank, Chicago	1886	Prince, A. E., Springfield	1884
Harms, Henry, Chicago	S	Lyford, W. H., Port Byron	S	Prince, L. H., Batavia	1891
Harper, J. E., Chicago	1882	Lytle, J. P., Princeton	S	Proctor, E. G., Kane	1886
Harris, B. H., Groveland	1884	McArthur, L. L., Chicago	1885	Prun, C. P., Chicago	1888
Harsha, W. M., Chicago	1887	McCaffigan, A. J., Carlisle	1887	Purdy, G. W., Chicago	1887
Hartley, J. D., Chicago	1884	McClelland, R. A., Yorkville	1887	Putney, W. G., Prairie Center	1887
Haskett, W. A., Alton	1877	McCullough, J. R., Chicago	1887	Pynchon, Ed., Irving Park	1886
Hatfield, M. P., Chicago	1884	McIlvaine, T. M., Peoria	1882	Quine, Wm. E., Chicago	S
Haven, A. C., Lake Forest	1886	McIntosh, A. J., Allendale	S	Ransom, W. L., Rockford	
Hayes, P. S., Chicago	1885	McIntosh, L. D., Ravenswood	1889	Rauch, J. H., Springfield	1875
Haynes, W. S., Chicago	1887	McLean, John, Pullman	1876	Reec, M., Abingdon	1874
Heise, Ellen H., Canton	1891	McMann, W. W., Gardner	1874	Read, N. S., Chandlerville	1873
Helm, W. B., Rockford	S	McMillan, P. H., Shiloh Hill	1886	Reichelsen, P., Chicago	S
Hemenway, H. B., Evanston	1885	McNary, W. H., Martinsville	1878	Reynolds, A. R., Chicago	1888
Henderson, J. P., Chicago	1887	McWilliams, S. A., Chicago	1877	Reynolds, H. J., Chicago	1882
Henry, Robt. F., Princeville	1886	MacArthur, R. D., Chicago	1888	Renshaw, S. M., Findlay	S
Hequembourg, J. E., Chicago	1887	Macdonald, P. S., Chicago	S	Rhodes, J. E., Chicago	1887
Herold, T., Elgin	S	Mackenzie, W. R., Chester	1884	Richards, W. M., Joliet	1883
Herriott, E. L., Jacksonville	1886	Malone, L. A., Jacksonville	1886	Richings, H., Rockford	1886
Hess, F. A., Chicago	1888	Mann, A. L., Elgin	S	Rivard, Geo. J., Assumption	1886
Hester, W. W., Chicago	1885	Manning, E., Rockford	S	Robbins, J., Quincy	S
Heylmann, C. J., Chicago	S	Marion, G. L., Elgin	S	Robbins, M. M., Aurora	1877
Hickman, T. G., Vandalia	1884	Marshall, J. S., Chicago	1882	Robison, J. A., Chicago	1887
Hilsabeck, W. F., Windsor	1890	Marshall, S. W., Sparta	1886	Rohr, G. W., Rockford	1877
Hilton, G. V., Woodlawn Park	1887	Martin, F. H., Chicago	1886	Romig, S. V., Rogers Park	1887
Hoadley, A. E., Chicago	1886	Martin, J. A., Palestine	S	Rook, C. W., Quincy	1884
Holderness, E. P. G., Chenoa	1885	Martin, L., Chicago	S	Rooney, A. F., Quincy	1890
Holgate, J. R., Castleton	S	Martin, S. C., Anna	1887	Rooney, M., Quincy	1884
Holliday, W. S., Monmouth	1887	Martin, Wm., Chicago	S	Root, E. H., Chicago	1887
Hollister, J. H., Chicago	1873	Martin, Wm. S., Tuscola	1890	Roseberry, B. S., Lacon	1891
Holin, C., Rockford	S	Mathews, J. P., Carlinville	1877	Roskoten, R., Peoria	1874
Holmes, Bayard, Chicago	1888	Mattison, F. C. E., Chicago	S	Ross, G. W., Carrollton	1886
Holmes, E. L., Chicago	1877	Maxson, O. S., South Evanston	S	Rosson, John B., Ava	1886
Holton, Noble, Harkers Corners	1885	Mayo, E. L., DeKalb	1887	Rouleau, Z., Manteno	S
Hoopman, S. V., Roanoke	1891	Meacham, S. F., Huntsville	S	Rowe, Mark, Redmon	1882
Hornbeck, N. B., Youngstown	1886	Melms, R., Chicago	S	Ryburn, J. T., Ottawa	1886
Hosmer, A. B., Chicago	1887	Mercer, F. W., Chicago	1887	Sandberg, K. M., Chicago	1889
Hotz, F. C., Chicago	1887	Mergler, M. J., Chicago	1887	Schafer, F. C., Chicago	1878
Howe, O. B., Chicago	S	Merriman, H. P., Chicago	1887	Schneck, J., Mt. Carmel	1885
Hoyt, J. W., Lebanon	S	Mettler, L. H., Chicago	1890	Schwartz, E., Knoxville	1887
Huber, J., Pava	1885	Myers, J. C., Clinton	1886	Scudder, H. M., Chicago	1886
Hull, M. D., Arrowsmith		Miller, DeLaskie, Chicago	1886	Seaman, M. W., Shipman	1884
Hunt, C. G., Dixon	1877	Miller, E., Kensington	S	Seeley, T. P., Chicago	1883
Hunter, C. T., Springerton	1886	Miller, J. H., Chicago	1886	Semple, W. F., Lake View	S
Huntsinger, J. C., Pinckneyville	1886	Miller, R. E., Chicago	1887	Senn, N., Chicago	1873
Hurlbut, V. L., Chicago	1863	Miller, T. N., Rockford	S	Seymour, Fred, Chicago	S
Hurst, S. T., Green View	1885	Miller, T. W., Chicago	1877	Sheperd, E. L., Elgin	S
Hutton, F. J., Millington	1886	Mintie, R. L., Chicago	S	Shipp, F. J., Petersburg	1881
Hyde, J. N., Chicago	1877	Mitchell, J. H., Mt. Vernon	1886	Simons, C. J., Chicago	1884
Illinois Hosp. for Insane	S	Mitchell, Orlando, Marshall	1888	Sims, S. N., St. Joseph	1887
Ingals, E., Chicago	1877	Mitchell, Robt. J., Girard	1886	Skerr, J. D., Chicago	1886
Ingals, J. Fletcher, Chicago	1877	Montgomery, L. H., Chicago	1882	Slater, A. S., Wataga	1883
Isham, Ralph N., Chicago	1889	Montgomery, Wm. T., Chicago	1886	Slater, Catharine B., Aurora	1882
Jackson, A. R., Chicago	1877	Moon, O. W., Lockport	1874	Sloan, W. K., Moline	1887
Jaggard, W. W., Chicago	1885	Moore, E. W., Decatur		Small, A. R., Chicago	1887
Jenks, D. S., Plano	1882	Moore, O. T., Marissa	1886	Small, J. W., Englewood	1887
Jennings, C. A., Delavan		Morgan, E. A., Maroa	S	Smith, C. G., Chicago	1864
Jones, G. W., Danville	1873	Moyer, H. N., Chicago	1888	Smith, Lee, Bloomington	1882
Jones, S. J., Chicago	1877	Mudd, W. A., Athens	1886	Sparling, W. H., Moweaqua	1891
Johnson, C. W., Litchfield	1886	Murphy, J. B., Chicago	1887	Spear, J. W., Mason City	1888
Johnson, F. S., Chicago	1883	Nash, A., Joliet	1872	Spear, L. E., Shirley	1886
Johnson, H. A., Chicago	1873	Nelson, D. T., Chicago	1877	Stanley, F. A., Chicago	1886
Judd, Herbert, Galesburg	1882	Nesbitt, G. W., Sycamore	1878	Starkey, H. M., Chicago	1887
Jump, D. W., Plainfield	1883	Newcomer, J. M., Petersburg		Starkweather, R. E., Chicago	1888
Kales, John D., Chicago	S	Newman, H. P., Chicago	1882	Stebbins, H. P., Englewood	S
Kauffmann, J. S., Blue Island	1887	Nielson, Theo., Chicago	S	Steele, D. A. K., Chicago	1877
Kellar, A. L., Sullivan		Noble, C. M., McLean	1882	Stillians, D. C., Chicago	1887
Kelso, H. A., Paxton	S	Nolan, E. C., Mt. Pulaski	S	Stoddard, G. W., Ramsey	1891
Kendall, H. W., Quincy	1872	Norderling, K. A., Rockford	S	Strong, A. B., Chicago	1886
Kennicott, P. A., Shermerville	S	Norris, A. Z., Farmer City		Stout, John, Ottawa	S
Kernahan, G., Chicago	S	Nutt, F. L., Marengo	1888	Stowell, J. H., Chicago	1887

Studer, E. B., Peoria	1891	Boor, W. A., Newcastle	1887	Hurt, W. J., Waynetown	1891
Suggett, W. L., Flora	1880	Boswell, A. J., Ft. Wayne	1884	Irwin, L. M., Lafayette	1884
Sullivan, J. C., Cairo	1873	Bowles, T. J., Muncie		Jenkins, W. O., Terre Haute	1886
Swan, W. S., Harrisburgh	1887	Brown, D. T., Michigan City	S	Johnson, L. C., Fountatn City	1888
Sweetland, W. M., Highland Park	1885	Brucker, C. H., Tell City	1888	Johnston, M. F., - ichmond	1888
Tagert, A. H., Chicago	1882	Bryan, T. M., Indianapolis	1885	Jones, George S., Covington	1887
Talbot, E. S., Chicago	1881	Bucklin, G. W., New Harmony	1887	Jones, R. E., Lebanon	1882
Tefft, Leslie E., Elgin	1887	Burke, G. W., Newastle	1882	Keegan, C. J., Canal	1888
Thomas, A. L., Chicago	1887	Burket, C. W., Warsaw	1887	Keen, L. S., Laporte	1878
Thompson, L. G., Lacon	1883	Burton, G. H., Mitchell	1874	Kelly, J. C., Mitchell	1891
Thompson, Mary H., Chicago	1886	Byers, A. R., Petersburg	1890	Kemper, G. W. H., Muncie	1883
Thompson, S., Blandinsville	1888	Cable, J., Spencer	1886	Kennedy, T. C., Shelbyville	1888
Tibbitts, L., Rockford	1880	Carson, L. O., Traders Point	1884	Kime, Rufus R., Petersburg	1886
Tilley, Robert, Chicago	1884	Casebeer, J. B., Auburn	1877	King, W. R., Greenfield	1884
Tillotson, H. J., Chicago	1890	Chafee, W. C., Huntington	1887	Knapp, Charles, Evansville	1886
Todd J. F., Chicago	1880	Chambers, J., Indianapolis	1884	Knapp, S. O., Frankford	1884
Trout, W. A., Atwater	1886	Charlton, S. H., Seymour	1875	Knepper, E. W., Ligonier	
Trnes ale, C., Rock Island	1882	Cline, L. C., Indianapolis	1890	Krausgrill, D., Wadesville	1888
Tully, A. M., Chicago		Clouser, N. B., Hartford City	1888	Kyle, L. M., Aurora	
Tyler, J. H., Clinton	1887	Coleman, A., Logansport	1876	Lamb, J., Aurora	1886
Uran, B. F., Kankakee	1887	Comingor, J. A., Indianapolis		Lane, W. H., Angola	1891
Vanderhoff, H. W., Wheaton	1888	Cook, C. P., New Albany	1886	Langsdale, R. G., Risiug Sun	1888
Vandervort, F. C., Bloomington	S	Cook, Geo. J., Indianapolis	1886	Lash, H. M., Indianapolis	1888
Van Horne, A. K., Jerseyville	1873	Crapo, G. W., Terre Haute	1878	Lemmon, S. W., Albion	1887
Venn, Charles, Chicago	S	Crapo, J. R., Terre Haute	1888	Lewis, E. R., Indianapolis	1887
Verity, W. P., Chicago	1882	Culbertson, R. H., Brazil	1881	Link, John E., Terre Haute	1877
Vertress, C. M., Murrayville	1886	Culbertson, Scott, Moorfield	1890	Linville, D. G., Columbia City	1874
Wadsworth, J. L. R., Collinsville	1873	Dancer, J., South Milford	1887	Lofland, W. A., Linden	S
Walbridge, J. P., Decatur	1887	Darby, A. B., Waterloo	1887	Lomax, William, Marion	1850
Walker, J. B., Effingham	1884	Daugherty, C. A., South Bend	1886	Lowder, L. T., Bloomington	1890
Wallace, J. H., Monmouth	1877	Davis, L. N., Farmland	1883	Lower, M. O., North Manchester	1886
Ward, W. E., Chicago	1887	Davison, H. C., Hartford City	1883	McCasky, G. W., Fort Wayne	1886
Wardner, H., Chicago	1860	Dayton, G. H., Lima	1880	McCormick, T. H., Fort Wayne	
Ware, Lyman, Chicago	1886	Defrees, H. J., Nappanee	S	McCoy, G. T., Columbus	1888
Waxham, F. E., Chicago	1886	Detchon, S. S., New Richmond	1891	McCoy, P. Y., Evansville	1890
Webster, G. W., Chicago	1887	Dickes, P., Boundary	1888	McCullough, H., Fort Wayne	1890
Webster, J. R., Monmouth	1873	Donaldson, E. F., Wabash	1884	McDonald, W. B., New Augusta	1890
Weld, F. J., Rockford	S	Dove, Silas C., Westfield	1890	McIntyre, C. W., New Albauy	1886
Wertenbaker, C. P., Chicago	1891	Drayer, P., Hartford City	1882	McMahan, S. M., Rushville	1883
West, E. A., Chicago	1890	Dunning, L. H., Indianapolis	1876	McMahon, W. R., Huntingburg	1875
Westcott, G. D., Chicago	1887	Eastern Indiana Hospital for Insane, Richmond	S	McShane, J. T., Carmel	1887
Wetmore, A., Waterloo	1886	Eastman, J., Indianapolis	1873	Mackey, G. W., Portland	1888
Whelpley, H. M., Cobden	1891	Eckelman, F. C., Elkhart	1887	Maddox, J. E., Montpelier	1888
White, J. L., Bloomington	1880	Edison, J. W., Bourbon		Martin, S. M., Greenfield	1878
Whitefield, G. W., Evanston	1891	Eichelberg, W. C., Terre Haute	1891	Martin, W. H., Kokomo	S
Whitford, Wm., Chicago		Elder, E. S., Indianapolis	1891	Maxwell, A., Indianapolis	1886
Whitney, J. D., Petersburg	1880	Evans, E. B., Greencastle	1882	Meyer, J. W. H., LaPorte	1888
Whitten, T. J., Jacksonville	1888	Ferguson, F. C., Indianapolis	1887	Mock, J. W., Covington	1888
Wilder, F. M., Chicago	1874	Fernier, P., Weisburg	1891	Moffett, E. D., Indianapolis	1890
Wilder, W. H., Chicago		Fisher, G. C., Indianapolis	1888	Moffit, W. R., Lafayette	1887
Will, O. B., Peoria	1886	Fitch, G. N., Logansport	1878	Montgomery, H. P., South Bend	1883
Willard, E. R., Wilmington	1872	Fitch, H. P., Lebanon	1891	Mooney, H. C., Laketon	S
Willard, G. E., Chicago		Fletcher, C. I., Indianapolis	1887	Moore, P. G., Wabash	1883
Willard, S., Mound City	S	Fletcher, W. W., Indianapolis	1886	Morris, J. E., Liberty	1876
Williams, D. H., Chicago	1887	Flynn, Wm., Marion	1887	Morrison, O. A. J., Middlefork	
Williams, J. F., Chicago	1887	Ford, J. H., Wabash	1886	Mullen, Alex. J., Jr., Michigan City	
Williams, J. S., Walpole	S	Forshee, T. W., Madison	1887	Munford, S. E., Princeton	1884
Williams, T. W., Casey	1887	Freeman, E. D., Osgood	1887	Murphy, E., New Harmony	1884
Willis, W. H., Whitefield	1887	Fry, C. W., Bracken	1884	Myers, H. K., Edinburg	1884
Wilson, J. T., Galesburg	1882	Fullinwider, C. H., Petersburg	1890	Myers, M., Ft. Wayne	1883
Wing, E., Chicago	1887	Fulton, J. C., Murray	1887	Neal, W. A., Elkhart	1886
Winn, G. L., Rockford	S	Garver, J. J., Indianapolis	1884	Norman, S., Evansville	1890
Wood, H. F., Chicago	S	Gerrish, M. F., Seymour	1888	O'Ferrell, R. M., Lafayette	1884
Woodworth, P. M., Chicago	1886	Good, A. H., Selma	1885	Oliver, J. H., Indianapolis	1888
Word, C. A., Chicago		Grant, G. H., Richmond	1888	O'Neal, L., Somerset	1883
Wright, J., Clinton	1867	Green, J. W., Shelbyville	1882	Owen, A. M., Evansville	1886
Wright, S. B., Stanford	1890	Greenawalt, G. L., Ft. Wayne	1883	Pantzer, H. O., Indianapolis	1887
Zeisler, J., Chicago	1887	Gregg, V. H., Connersville	1883	Parker, J., Colfax	1886
Zeller, G. A., Peoria	1887	Grisier, Fred G., Collins	1886	Parsons, C. H., Rushville	1884
		Hadley, E., Indianapolis	1888	Patterson, A. W., Indianapolis	1875
		Hamilton, S. N., Connersville		Pearse, S. H., Mt. Vernon	1875
		Hanna, L. M., Greencastle	1886	Perry, W. J., Alexandria	
		Hargove, W. S., New Salem		Pfaff, A. G., Indianapolis	1888
		Harper, H. F., Merom	1876	Pierson, A., Spencer	1887
		Hawkins, E., Greencastle	S	Porter, A. G., Lebanon	1877
		Hayden, A. M., Evansville	1886	Porter, M. F., Fort Wayne	1881
		Hayes, G. C., Hillsboro	1880	Powell, J. Z., Logansport	1887
		Hays, F. W., Indianapolis	1888	Pugh, J. W., Upland	1875
		Hazel, J. B., Claypool	1888	Purviance, S. W., Crawfordsville	1875
		Heath, F. C., Indianapolis	1888	Ramsey, D. C., Mt. Vernon	1885
		Heaton, Conley, Aurora	1888	Rea, John, Newcastle	1870
		Helm, C. J., Peru	1888	Rea, O. A., Marmont	1890
		Henley, A., Fairmount	1877	Ringo, J. L., Elwood	S
		Henry, W. C., Aurora	1883	Robins, A. H., Rochester	1890
		Herr, H. S., Westfield		Rogers, Aaron G., Parker	1888
		Hervey, J. W., Indianapolis	1885	Rooker, J. I., Castleton	1888
		Hess, J. N., New Marion	1888	Rosenthal, I. M., Fort Wayne	1867
		Hibberd, J. F., Richmond	1864	Rowe, L. M., Indianapolis	1886
		Hickes, C., Caborns	1890	Salb, J. P., Jasper	1890
		Higgins, C. B., Peru	1883	Sawyer, F. M., South Bend	1887
		Hinkle, J. R., Sullivan		Schaefer, C. R., Indianapolis	1890
		Hodges, E. F., Indianapolis	1887	Scott, J. W. C., Hecla	1888
		Hodges, F. J., Anderson	1891	Scott, William, Kokomo	1883
		Holton, W. M., New Harmony	1879	Scull, D. C., Lebanon	1890
		Holtzendorff, A. O., Plymouth	1887	Sebring, D. A., Auburn	1890
		Hon, U. H., Bloomington	1888	Sexton, J. C., Rushville	1887
		Howard, N. P., Greenfield	1880	Shepard, S. D., Everton	1888
		Howard, N. P., Jr., Greenfield	1884	Shobe, W. A., Ligonier	S
		Hubbard, W. H., Marion		Short, W. H., LaGrange	1888
		Hunt, J. W., Anderson		Shull, C., Montpelier	1884
				Siemon & Bro., Fort Wayne	S

INDIANA.

Adams, J. R., Petersburg	1879
Ader, H., Somerset	1873
Andrew, G. L., La Porte	1877
Anthony, J. R., Brownstown	1891
Armitage, D. R., Muncie	1881
Arnold, John, Rushville	1875
Arthur, G. S., Portland	1883
Bacon, C. P., Evansville	1874
Bailey, G. D., Spiceland	1888
Baker, J. H., Stockwell	1886
Ball, J. S., Judson	1888
Banker, A. J., Columbus	1886
Bastin, J. V., Belle Union	S
Batman, W. F., Ladoga	1890
Beard, F. W., Vincennes	1883
Beasley, G. F., Lafayette	1878
Becknell, Irvin J., Milford	1884
Bell, Guido, Indianapolis	1890
Bell, W. H., Logansport	1874
Berteling, J. B., South Bend	1888
Binkley, J. T., Evansville	1891
Blitz, A., Indianapolis	1888
Blitz, L. B., Evansville	
Bloomfield, E. M., Peru	1883
Blount, R. F., Wabash	1882
Bond, C. S., Richmond	1887
Bond, R. C., Aurora	1888
Bonnell, M. H., Lebanon	1888

Smith, A. J., Wabash 1884
 Smith, C. H., Lebanon 1883
 Smith, W., Delhi 1891
 Smythe, G. C., Greencastle 1879
 Spencer, E. V., Mt. Vernon 1886
 Spencer, Wm., Monticello 1890
 Steman, C. B., Fort Wayne 1891
 Stewart, J., Anderson 1884
 Stockton, Sarah, Indianapolis 1890
 Sutcliffe, J. A., Indianapolis 1884
 Sutton, Harley H., Aurora 1888
 Swartz, D. J., Auburn 1888
 Teal, N., Kendallville 1878
 Thomas, S. C., Milroy 1882
 Thompson, G. W., Winamac 1883
 Thompson, J. L., Indianapolis 1883
 Todd, L. L., Indianapolis 1885
 Trees, I. W., Smithland 1888
 Vaughan, George T., Evansville 1890
 Veneman, R. T., Troy 1890
 Vincent, H. C., Guilford 1875
 Vinnedge, N. W., Lafayette 1873
 Von Sweringen, H., Fort Wayne
 Wagner, T. A., Indianapolis
 Wahl, G. F., Bremen 1888
 Walker, D. R., Reese's Mills 1890
 Walker, E., Evansville 1891
 Walker, W. S., Lafayette 1883
 Waller, W. H., Angola 1885
 Ward, J., Union 1887
 Waterman, L. D., Indianapolis 1870
 Webster, J. C., Lafayette 1880
 Weever, J. B., Evansville 1884
 Weist, J. R., Richmond 1876
 Welborn, G. W., Stewartsville 1887
 Wertz, T., Evansville 1887
 Wetherell, R. B., Lafayette 1887
 Wherry, Mary A., Fort Wayne 1888
 Whitcomb, J. H., Boswell 1887
 White, C. A., Danville 1888
 White, E. G., Lagrange 1887
 Whitesell, P. P., Clarksville 1887
 Williams, J. P., Huntingburg 1885
 Williams, L., Marion 1867
 Williams, S. T., Kendallville 1883
 Wilson, A. L., Indianapolis 1890
 Wilson, J. H., Plymouth 1887
 Wishard, W. N., Indianapolis 1884
 Wood, H. D., Angola 1874
 Wood, T. F., Metz 1876
 Woodburn, F. C., Indianapolis 1888
 Woolen, G. V., Indianapolis 1884
 Work, J. A., Elkhart 1883
 Yenne, C. H., Owensburg S
 Yost, J. L., Mitchell
 Young, S. J., Terre Haute 1877
 Younkman, A. B., Bremen 1886

IOWA.

Adair, L. J., Anamosa 1883
 Baker, E. L., Indianola 1883
 Baker, J. W. H., Davenport 1888
 Bean, J. V., Fairfield 1888
 Beggs, G. W., Sioux City 1882
 Bergen, Andrew C., Sioux City 1889
 Birney, C. C., Estherville 1882
 Blair, E. P., Gorner 1891
 Blakeslee, E., Anamosa 1873
 Blanchard, L., Edgewood 1883
 Bond, L. L., West Side 1887
 Boucher, F. H., Marshalltown 1888
 Bowen, A. B., Maquoketa 1876
 Bradley, Chas. C., Manchester 1890
 Brannard, D. S., Staceyville 1882
 Bricks, P. L., Lemars S
 Brookhausen, B. E., Lansing 1882
 Brookings, D. J., Woodward 1885
 Brown, H. W., Waterloo 1887
 Brown, Luther, Rockford 1885
 Buddy, A. D., St. Ausgar 1886
 Burd, Edwin, Lisbon 1887
 Burroughs, S. E., Allison S
 Caldwell, T. J., Adel S
 Campbell, W. D., Marshalltown 1887
 Carpenter, G. P., Cedar Rapids 1891
 Carson, J., Mt. Vernon 1884
 Carter, G. H., Marshalltown 1882
 Clapp, E. F., Iowa City 1884
 Clark, E. W., Grinnell 1877
 Clark, Remaldo D., Akron 1889
 Cleaver, J. H., Council Bluffs 1884
 Cleaves, L. R., Cherokee 1890
 Cobb, W. F., Mona 1882
 Cook, S. D., Sigourney 1882
 Corselies, J. C., Galesburg
 Cottle, C. C., Marshalltown 1890
 Craig, N. S., Manchester 1887
 Crawford, G. E., Cedar Rapids 1887
 Criley, B. H., Dallas Centre 1878

Crouse, D. W., Waterloo 1878
 Darnall, C. F., West Union
 Darnall, G. D., West Union 1882
 Davis, W. H., Maquoketa
 Dean, H. M., Muscatine
 Deering, A. A., Boone 1878
 Dickinson, D. J., Corydon
 Divine, J. H., Sioux Rapids 1886
 Douglas, T. J., Ottumwa 1887
 Duffin, W. L., Guttenburg 1887
 Dunlavy, J. C., Sioux City 1887
 Eckley, W. T., Fort Madison 1887
 Eiskamp, G. H., Washington 1889
 Emmert, J., Atlantic 1882
 Enfield, C., Jefferson 1886
 Ensign, H. D., Boone 1878
 Eschbach, H. C., Albia 1887
 Evans, O. E., Gowrie 1882
 Evans, T. R., Burlington S
 Everett, J. T., Grinnell S
 Ewers, H. F., Burlington S
 Fairchild, D. S., Ames 1882
 Farnsworth, P. J., Clinton 1873
 Field, A. G., Des Moines 1888
 Fitzgerald, W., Grand Mound 1887
 Fullerton, O. J., Waterloo 1876
 Gamble, T. D., Wheatland 1882
 Getz, H. L., Marshalltown 1882
 Gilman, H. A., Mt. Pleasant 1885
 Gibbon, W. H., Chariton 1885
 Gorrell, J. R., Newton 1890
 Green, J. W., Lacy S
 Greenleaf, D. C., Bloomfield 1887
 Griffin, C. C., Vinton 1877
 Grimes, W. S., Wapello 1882
 Guilbert, E. A., Dubuque 1882
 Gutch, W., Albia 1876
 Hackett, C. J., Le Mars 1882
 Hadsel, H. S., Maynard 1887
 Hanawalt, G. P., Des Moines 1878
 Hanna, Rebecca, Red Oak 1886
 Harsh, I. M., Griswold 1887
 Hart, J. R., Charter Oak 1882
 Hazen, E. H., Des Moines 1872
 Hedges, T. M., Grinnell 1884
 Herlman, E. C., Ida Grove S
 Hiett, F. M., Red Oak 1890
 Hill, G. H., Independence 1882
 Hill, Nancy M., Dubuque 1887
 Hill, R. W., Iowa City
 Hinkle, G. W., Harvard S
 Hobart, A. J., Clinton 1882
 Hobby, C. M., Iowa City 1884
 Hoffman, R. C., Oskaloosa 1886
 Holliday, J. W., Burlington 1886
 Hornibrook, E., Cherokee
 Hughes, Jr., J. C., Keokuk 1882
 Hyatt, B. F., Ottumwa 1886
 Ingells, J. B., Meriden 1884
 Jenkins, G. F., Keokuk 1873
 Joralemon, J. C., Toledo 1887
 Kean, N. L., Northwood 1884
 Kegley, E. A., Cedar Rapids 1884
 Kemmerer, C. T., Eldridge 1889
 King, E. H., Muscatine 1884
 Kirkendall, E. E., W. Burlington 1887
 Knott, J. M., Sioux City 1878
 Lacey, T. B., Council Bluffs 1887
 Ladd, J. A., Traer
 LaForce, D. A., Ottumwa 1886
 Langan, D., Clinton 1872
 Leipziger, H. A., Burlington 1889
 Llewellyn, P. W., Clarinda 1886
 Lewis, C. G., Ottumwa 1882
 Lewis, J. R., Grinnell 1888
 Littig, L. W., Iowa City 1891
 Love, J. S., Springville 1877
 Lowry, O. W., Grand Junction 1887
 Lukens, C. B., Oskaloosa 1887
 Lytle, S. S., Iowa City 1885
 McClain, W. H., Conrad Grove 1885
 McCleary, J. D., Indianola 1887
 McCluer, B., Dubuque 1878
 McClure, A. W., Mt. Pleasant 1882
 McClure, T. G., Douds Station 1884
 McCown, Jennie, Davenport 1882
 McCue, J. G., Blenco S
 McDonald, O. P., Keokuk 1882
 McKenzie, H. M., Elwood 1884
 McLean, Chas., Griswold
 MacQuigg, W., Lyons 1882
 Macrae, D., Council Bluffs 1886
 Markham, H. E., Independence 1882
 Maxwell, T. J., Keokuk 1876
 Mehler, P. C., New London 1887
 Meredith, M., Vinton 1877
 Middleton, W. D., Davenport 1887
 Miller, C. W., Preston S
 Miller, E. C., Rockwell 1882
 Minges, Geo., Dubuque 1883
 Moore, L. C., Buffalo S

Morgan, A. W., DeWitt 1886
 Morse, C. H., Eagle Grove S
 Mueller, J. A., Dyersville 1887
 Murphy, Garrett, Nora Springs 1884
 Murphy, W. G., Daubury S
 Mygatt, A. S., Rolfe S
 Newmau, M. M., Edgewood 1887
 Nicol, Jno. H., Lacona 1887
 Osborne, M. C., Delmar 1884
 Overholt, D. W., Columbus Junction 1876
 Page, H. R., Des Moines 1882
 Page, J. Frank, Mystic 1888
 Park, Geo., Sioux City 1888
 Park, W. M., Indianola 1880
 Parker, C. C., Fayette 1884
 Parker, Jr., J. M., Mt. Pleasant 1891
 Parr, T. S., Indianola 1879
 Patchen, R. A., Des Moines 1883
 Peck, Frank P., Mt. Pleasant 1889
 Peck, W. F., Davenport 1865
 Philpott, J. W., Ft. Madison 1887
 Pierce, S. N., Cedar Falls 1885
 Pipino, W. G., Des Moines 1888
 Plumb, E. B., Ames 1887
 Powell, Chas. B., Albia 1887
 Powers, M. J., Oskaloosa S
 Priestly, Jas. T., Des Moines 1886
 Ransom, Horace G., Burlington 1877
 Rawls, J. A., Creston
 Rawson, A. A., Corning 1884
 Reed, A. B., Cedar Rapids 1880
 Reynolds, A., Clinton 1887
 Reynolds, E. M., Centerville 1884
 Reynolds, J. D., Creston 1887
 Richards, W. O., Waterloo 1885
 Rigger, John A., What Cheer 1887
 Ristine, G. H., Fort Dodge 1883
 Ristine, H., Cedar Rapids 1877
 Ristine, J. M., Cedar Rapids 1887
 Robertson, J. C., Council Bluffs 1885
 Robinson, S. E., West Union 1882
 Rogers, H. S., Red Oak 1884
 Rolfe, B. F., Staceyville 1882
 Roome, J. C., Calmar 1884
 Ruth, C. E., Muscatine 1886
 Sanders, C. J., Clare S
 Sanson, J. B., Tipton 1885
 Savage, I. P., Sioux City 1888
 Sawyers, J. L., Centerville 1887
 Sawyers, S. H., Unionville 1873
 Schooler, L., Des Moines 1887
 Schofield, D., Washington 1887
 Scroggs, J. A., Keokuk 1887
 Searle, W. B., Ottumwa 1882
 Seybert, F. T., Council Bluffs 1886
 Seymour, F. E., Fort Dodge S
 Sherman, E. Amelia, National 1886
 Sherman, J. A., Cherokee 1886
 Sherman, J. M., Indianola 1887
 Sherman, W. B., Manchester 1887
 Shrader, J. C., Iowa City 1873
 Shuell, T. J., Parnell 1887
 Skinner, G. A., Cedar Rapids 1891
 Skinner, W. M., Anamosa 1884
 Sloan, M. G., Dexter 1885
 Smead, C. O., Sully 1890
 Smith, C. H., Mason City 1882
 Smith, E. R., Toledo 1886
 Smith, F. R., Fairfield 1887
 Smith, J. W., Charles City 1873
 Smouse, D. W., Des Moines 1885
 Sones, ————, Panora S
 Speaker, W. T., Manson
 Spilman, S. A., Ottumwa 1882
 Stanton, T. P., Chariton 1890
 Staples, G. M., Dubuque 1872
 Stewart, L., Council Bluffs
 Storch, A. B., Alta 1883
 Tedsow, J. B., Williams 1891
 Thomas, F. S., Council Bluffs 1886
 Thornton, J. H., Lansing
 Townsend, D. J., Lohrville 1890
 Treat, J. A., Stuart 1887
 Tuttle, Mary B., Burlington 1891
 Udell, C. N., Blakesburg 1885
 Vail, A. M., Rock Rapids 1887
 Vest, W. E., Montezuma 1891
 Waggener, E. A., Burlington 1886
 Walter, A. F., Gladbrook S
 Ward, Fred. M., Marshalltown 1882
 Ward, G. B., Fairbank
 Ward, W. H., Des Moines 1882
 Warne, Geo., Independence 1880
 Watson, Wm., Dubuque 1876
 Welch, I. L., Humboldt 1883
 Wick, D. M., New Hartford 1886
 Weir, F. A., Jesup 1882
 Wilkinson, A. D., Dennison 1889
 Wilkinson, J. E., Ottumwa 1887
 Will, F. J., Eagle Grove 1886
 Williams, R. R., Manning 1884

Williams, W. H., Wall Lake	1891
Williamson, J., Ottumwa	1882
Witte, Max E., Mt. Pleasant	1885
Worley, J., Belle Plaine	1882
Wright, A. L., Carroll	1882
Wright, W. E., Knoxville	1884
Young, E. B., Red Oak	1890
Young, H. B., Burlington	1882
Young, J. W., Bloomfield	1884

KANSAS.

Aikman, R., Fort Scott	1884
Ballou, J. H., Haven	1886
Bell, J., Olathe	1882
Bibbee, J. M., Wichita	1888
Blair, A., Pittsburg	1886
Cole, D. V., Winfield	1887
Cole, F., Garden City	1876
Coleman, T. M., Newton	1883
Cunkle, L. J., Madison	S
Cunningham, M. E., Garnett	1886
Daily, F. M., Scottsville	1890
Daugherty, P., Junction City	1886
Devlbiss, J. N., La Cygne	S
Deweese, Wm. B., Salina	1884
Dickman, F. F., Fort Scott	1886
Dillon, J., Eureka	1886
Emerson, George, Winfield	1886
Foote, J. S., Wichita	1887
Foulks, C. A., Kansas City	1883
Gardiner, C., Emporia	1887
Gill, H. Z., El Dorado	1889
Harvey, Z. T., Council Grove	1883
Hill, Harvey D., Augusta	1886
Horner, Levi, Lawrence	1890
Jacobs, L. D., Emporia	1883
Lanphear, S. E., Hartford	1886
Lane, James A., Lawrence	1890
Leslie, C. E., Clyde	1880
Longshore, D. K., Topeka	1887
McCully, W. A., Independence	1887
McNary, O. C., Nat'l Military House	1890
McVey, Wm. E., Topeka	1890
Minney, John E., Shawnee	1886
Mitchell, M. R., Topeka	1885
Morgan, B. F., Riley Centre	1873
Mottram, C. V., Lawrence	1887
Oldham, J. E., Wichita	S
Ransom, M. A., Topeka	S
Reynolds, L., Horton	1877
Round, F. L., Dighton	1886
Runyon, E. C., Wichita	1886
Schenck, F. E., Harveyville	1883
Schenck, W. L., Topeka	1886
Shaw, Edwin B., Osage City	1883
Smolt, C. F., Nickerson	1886
Tefft, H. K., Topeka	1885
VanEman, W. J., Leavenworth	1890
Ward, M. B., Topeka	1888
Wever, Joseph L., Leavenworth	1888

KENTUCKY.

Adamson, H. K., Maysville	1891
Anderson, T., Louisville	1888
Bailey, Wm., Louisville	1886
Barbour, C. C., Newport	1888
Barrow, David, Lexington	1890
Beeler, G., Clinton	1885
Boyd, Frank, Paducah	1890
Brooks, J. G., Paducah	1882
Brown, H., Hustonville	1884
Butt, Albert L., Adairville	1890
Caldwell, Wm. H., Lexington	1890
Carpenter, J. G., Stanford	1888
Cartwright, H. P., Bowling Green	1890
Cheatlam, W., Louisville	1886
Clarke, Frank H., Lexington	1889
Clemens, J. M., Louisville	1886
Coffman, W. H., Georgetown	S
Coleman, B. L., Lexington	1879
Coleman, W. W., Mt. Washington	1888
Cook, W. V., Corydon	1890
Coomes, M. F., Louisville	1887
Cowan, H. J., Danville	1888
Creel, M. R., Central City	1887
Crenshaw, J. M., Mt. Washington	S
Dabney, S. G., Louisville	1891
Dismukes, J. L., Mayfield	1890
Dixon, A., Henderson	1888
Dunlap, F., Danville	1885
Farris, Alex. A., Hickman	1890
Fessenden, C. S. D., Louisville	1853
Foster, John M., Richmond	S
Frank, Johnstou, Little Cypress	1888
Grant, H. H., Louisville	1886
Green, F. D., Louisville	1889
Greenley, T. B., West Point	1877

Griffith, G. W., Louisville	1887
Hallaway, James M., Louisville	1887
Hampton, S. E., Milton	1890
Handley, V. L., Sturgis	1890
Hauna, W. M., Henderson	1873
Heath, M. C., Richmond	1888
Hickman, L. B., Hopkinsville	1884
Hodge, J. A., Henderson	1859
Hood, W. H., Orangeburg	1875
Howard, R. J., Pryorsburg	1888
Ingram, Julia, Louisville	1888
Jennings, W., Richmond	1888
Johnstone, A. W., Danville	1887
Jordan, W. A., Clinton	1889
Keen, W. C., Albany	1888
Kelly, E., Lebanon	1888
Kenyon, E. F., Middlesborough	1887
Larrabee, John A., Louisville	1887
Lassing, H. C., Union	1890
Letcher, J. H., Henderson	1885
Letcher, S. M., Richmond	1890
Luten, J. R., Fulton	1890
Luten, S. W., Cayce	1886
McChord, R. G., Lebanon	1885
McCormack, J., Bowling Green	1884
McDowell, H., Cynthia	1885
McKeel, P. W., Wingo	1887
McMasters, D. H., Pryorsbnrg	1890
McMurtry, L. S., Louisville	1882
McNary, H. F., Princeton	1875
Mann, Charles, Nicholasville	1873
Marvin, J. B., Louisville	1886
Matthew, Joseph M., Louisville	1886
Matthews, S. J., Mayfield	1810
Meek, J. M., Morgan	1880
Morris, N. G., Fulton	1890
Octerloney, J. A., Louisville	1873
Owsley, Wm. T., Glasgow	1890
Peck, J. M., Arlington	1890
Pennington, H. V., London	S
Perkins, George, Somerset	1875
Peyton, J. F., Stanford	1888
Pollard, Miss A. V., Louisville	S
Poyntz, J. M., Richmond	1888
Prewitt, J. V., West Point	1890
Price, A. D., Harrodsburg	1884
Price, J. L., Sherman	1888
Rachford, B. K., Newport	1888
Ray, J. M., Louisville	1886
Reynolds, Dudley, Louisville	1872
Richardson, Edward, Louisville	1874
Richmond, W. W., Clinton	1885
Roberts, Wm. O., Louisville	1887
Royster, Floyd, Corydon	S
Seargent, A., Hopkinsville	1886
Scarborough, J. R., Spring Hill	1890
Scott, Preston B., Louisville	1886
Seitz, L. A., Louisville	S
Skillman, H. M., Lexington	1888
Smith, A. W., Richmond	1888
Stevens, E. A., Mayfield	1890
Stewart, P. H., Paducah	1890
Stiles, F. M., Hopkinsville	1890
Stranss, Leon, Shepherdsville	1890
Stuckey, T. H., Louisville	1890
Thomas, J. P., Hopkinsville	1875
Thomas, J. W., Mayfield	1888
Todd, L. B., Lexington	1877
Violette, J. D., Williamstown	1890
Wallace, H. H., Hopkinsville	1890
Ware, C. D., Independence	1883
Waterfield, A. P., Paducah	1890
Wathen, W. H., Louisville	1883
Wayne, A. B., Fulton	1890
Wiley, E. M., Harrodsburg	1888
Willis, R. L., Lexington	1890
Willis, S. W., Pine Grove	1888
Wilson, John M., Williamstown	1888
Yandell, D. W., Louisville	1866

LOUISIANA.

Allen, Thomas J., Shreveport	1885
Arcluriard, P. E., New Orleans	1885
Anstin, W. G., Quarantine	1885
Billin, D. H., Shreveport	1885
Casson, John, Alexandria	S
Chaillé, S. E., New Orleans	1879
Culpepper, C. L., Weston	S
Czarnowski, D., New Orleans	1885
Day, R. H., Baton Rouge	1884
Dickson, W. L., Rush Point	1884
Egan, J. C., Shreveport	1877
Formento, F., New Orleans	1890
Fox, D. R., Jesuits' Bend	1885
Friedrich, G. J., New Orleans	1884
Gazzo, J. B. C., Thibodeaux	1884
Henry, S. L., New Orleans	1878
Jones, Joseph, New Orleans	1885
Lawrence, G. B., New Orleans	1885

Logan, Samuel, New Orleans	1885
Matas, R., New Orleans	1885
Mouette, G. N., New Orleans	S
Newton, I. J., Bastrop	S
Oden, R. E., Babbs Bridge	1885
Owens, C. D., Eola	1886
Parham, F. W., New Orleans	S
Parker, W. E., New Orleans	1885
Price, E. B., Alexandria	1885
Pugh, John L., Albemarle	1885
Pugh, T. H., Napoleonville	1855
Richardson, T. G., New Orleans	1885
Souchon, E., New Orleans	S
Stewart, C. S., Amite City	1889
Sutherland, W. K., Mansfield	1885
Seydewitz, von P., New Orleans	1885
Wallis, H. M., Houma	1885
White, W. D., Abbeville	1882
Woolf, T. J., New Iberia	1888
Yoakum, F. E., Shreveport	1888

MAINE.

Dana, David, Freeport	1891
Dunn, B. F., Portland	1891
Estabrook, T. L., Rockland	1879
Foster, T. A., Portland	1882
Fuller, A. J., Bath	1878
Garcelon, A., Lewiston	1873
Gordon, S. C., Portland	1883
Hill, Hampton E., Saco	1884
Hitchcock, E. E., Rockland	1880
Hunter, Samuel B., Machias	1889
Kendrick, C., Litchfield Corners	1884
Loughton, S., Bangor	1876
Levensaler, H. C., Thomaston	1891
Marston, D. E., Monmouth	1884
Oakes, Wallace K., Auburn	S
Seavey, C., Bangor	1889
Skinner, David N., Auburn	1889
Sleeper, Frank, Sabattus	1880
Small, J. M., Lewiston	1876
Snow, A. P., Winthrop	1891
Spear, D. D., Freeport	1884
Thayer, F. C., Waterville	1884
Webster, C. E., Portland	1884
Wedgewood, M. C., Lewiston	1884
Weeks, H. S., Portland	1876

MARYLAND.

Anderson, E., Rockville	1891
Ashby, T. A., Baltimore	1884
Bevan, C. F., Baltimore	1884
Biedler, H. H., Baltimore	1889
Bombaugh, C. C., Baltimore	1884
Branham, J. H., Baltimore	1890
Brune, T. B., Baltimore	1891
Chamberlain, J. E. M., Easton	1880
Chambers, J. W., Baltimore	1884
Chancellor, E. W., Baltimore	1891
Chisolm, J. J., Baltimore	1880
Cross, E. D., St. Dennis	1891
Cuddy, J. W. C., Baltimore	1877
Eastman, L. M., Baltimore	1891
Ellis, R. H. P., Baltimore	1891
Evans, Thomas B., Baltimore	1872
Farquhar, C., Olney	1884
Friedenwald, A., Baltimore	1891
Friedenwald, H., Baltimore	1891
Gardner, W. S., Baltimore	1884
Gibbons, J. E., Baltimore	1884
Hartman, J. H., Baltimore	1870
Howard, W. T., Baltimore	1855
Johnston, C., Baltimore	1888
Kelly, H. A., Baltimore	S
Latimer, Joseph T., "T. B."	1884
Latimer, T. S., Baltimore	1889
McComas, J. L., Oakland	1884
Macgill, C. G. W., Catonsville	1884
Mackenzie, J. N., Baltimore	1884
Martin, Newell, Baltimore	1891
Martinet, J. F., Baltimore	S
Med. Chir. Faculty of Md., Baltimore	1868
Morris, John, Baltimore	1884
Neff, J., Baltimore	1884
Opie, T., Baltimore	1889
Osler, Wm., Baltimore	1884
Powell, A. H., Baltimore	1881
Rasin, R. C., Baltimore	1891
Reid, E. M., Baltimore	1884
Reynolds, H. T., Baltimore	1875
Reynolds, George B., Baltimore	1889
Rohé, G. H., Baltimore	1884
Roman, S. T., Conowingo	1884
Rowe, M., Deals Island	1891
Salzer, H., Baltimore	S
Scarff, J. H., Baltimore	1891
Sellman, W. A. B., Baltimore	1880

Skilling, W. Q., Lonaconing. 1888
 Smart, L. G., Baltimore. 1891
 Smith, A. P., Baltimore. 1883
 Smith, F., Baltimore. 1891
 Steiner, L. H., Baltimore. 1850
 Street, D., Baltimore. 1890
 Taneyhill, G. Lane, Baltimore. 1884
 Thomas, G., Baltimore. 1891
 Thomas, James C., Baltimore. 1880
 Tiffany, L., McL., Baltimore. 1891
 Uhler, J. R., Baltimore. 1876
 VanBibber, J. B., Baltimore.
 VanBibber, W. O., Baltimore. 1865
 Welch, W. H., Baltimore.
 Whitbridge, Wm., Baltimore. 1883
 Williams, Arthur, Elk Ridge. 1889
 Williams, J. W., Baltimore. 1891
 Williams, P. C., Baltimore.

MASSACHUSETTS.

Abbott, S. W., Boston. 1889
 Adams, Z. B., Framingham. 1880
 Adams, S. F. A., Pittsfield. 1881
 Adams Nervine Asylum, Jamaica Plns.
 Station. S
 Andrews, R. F., Garduer. 1878
 Andrews, Robert R., Cambridge. 1889
 Andrews, W. H., Springfield. 1890
 Barrett, W. M., Boston. 1880
 Bass, Will am, Lowell. 1878
 Belt, Charles B., Boston. 1888
 Bigelow, Horatio R., Boston. 1884
 Billings, Lucius F., Barre. 1889
 Blodgett, Albert G., West Brookfield. 1889
 Blodgett, A. N., Boston.
 Boston Medical Library, Boston. S
 Bowditch, H. I., Boston. 1848
 Bradford, E. H., Boston. 1888
 Briggs, E. C., Boston. 1883
 Brown, Wesley E., Gilbertsville. 1887
 Bullard, W. M., Boston. 1883
 Bush, J. F., Boston. 1884
 Calkins, Marshall, Springfield. 1866
 Carolin, W. L., Lowell. 1884
 Chamberlain, C. N., Lawrence. 1876
 Chamberlain, M. S., Boston. 1880
 Channing, W., Brookline. 1880
 Chenery, E., Boston. 1885
 Clark, Aug. P., Cambridgeport. 1880
 Clarke, Maurice D., Haverhill. S
 Cobb, C. H., Boston. 1884
 Coffin, A. B., Dorchester. 1891
 Cook, C. H., Natick. 1889
 Cornish, A., New Bedford. 1887
 Cottrell, S. P., Boston. 1889
 Cowles, Edward, Somerville. 1878
 Crawford, Sarah M., Boston. 1889
 Cunningham, T. E., Cambridgeport. S
 Davis, Ella M., Westfield. 1891
 Davis, G. W., Holyoke. 1891
 Davis, Robert T., Fall River.
 Davis, Wesley, Worcester. 1889
 Dearing, T. Haven, Braintree. 1887
 Dean, R. S., U. S., N., Chelsea. 1890
 Delahanty, W. J., Worcester. S
 District Medical Library, Worcester. S
 Donnelly, J. C., Boston.
 Dwelly, J., Fall River. 1884
 Edes, Robert T., Jamaica Plains. 1889
 Fisher, T. W., Boston. 1876
 Fisk, Cyrus M., Lowell. 1889
 Fox, C. L., Boston.
 French, George M., Malden. 1889
 Garland, George M., Boston. 1885
 Gay, George W., Boston. 1889
 Gaven, M. F., Boston. 1884
 Giddings, T., Housatonic. 1876
 Gerry, E. P., Suffolk. 1889
 Gilber, J. H., Quincy. 1876
 Gordon, J. A., Quincy. 1883
 Graham, Douglas, Boston. 1890
 Hill, E. H., Plymouth.
 Hooper, F. H., Boston. 1880
 Hooper, F. H., New Bedford. 1889
 Hough, G. T., New Bedford. 1874
 Howard, Geo. C., Lawrence. 1889
 Howe, F. A., Newburyport. 1883
 Hubbard, F. A., Taunton. 1889
 Hulme, Lanra, Worcester. 1889
 Hunt, David, Boston. 1880
 Huse, Ralph C., Georgetown. 1889
 Hyde, G. S., Boston. 1865
 Irish, J. C., Lowell. 1878
 Jackson, J. H., Fall River. 1884
 Jones, D. W., Boston. 1877
 Jefferson, H. P., Lowell. 1884
 Jeffries, John A., Boston.
 Johnson, John W., Boston. 1887
 Leavitt, W. W., Pittsfield.

Louis, Isaac, Boston. 1889
 McCaffrey, D. J., Blackstone. S
 Macomber, W. G., Central Village. 1885
 Marcy, H. O., Boston. 1876
 Martin, G. A., Franklin. 1889
 Martin, Stephen, Boston. 1889
 Maynard, John P., Dedham. 1889
 Mercer, W. M., Pittsfield. 1884
 Miller, W. S., Worcester. S
 Miner, D. W., Ware. 1878
 N. B. Med. Lib. Ass'n, New Bedford. S
 Nelson, S. N., Revere. 1884
 Nichols, A. H., Boston. 1890
 Norris, A. L., Cambridgeport. 1876
 Paddock, F. K., Pittsfield. 1880
 Parker, M. G., Lowell. 1877
 Parson, F. S., Boston. 1889
 Patch, E. L., Stoneham. S
 Patch, F. F., Boston. 1865
 Pattee, A. F., Boston. 1884
 Pinkham, Jos. G., Lynn. 1889
 Porter, Chas. B., Boston. 1889
 Presbery, Silas D., Taunton. 1889
 Putnam, J. M., Chelsea. 1880
 Rensom, N. M., North Carver. 1889
 Rice, J. Marcus, Worcester. 1889
 Richardson, M. R., Boston. 1889
 Robinson, W. S., Taunton. 1880
 Roeth, A. G., Boston. 1885
 Rotch, T. W., Boston. 1881
 Sackford, C. H., Chelsea.
 Sawyer, E. A., Gardner.
 Sawyer, F. A., Wareham. 1873
 Shattuck, Frederick C., Boston. 1888
 Sidney, A. W., Fitchburg. 1881
 Sinclair, A. D., Boston. 1885
 Smith, Geo. C., Natick.
 Standish, Miles, Boston. 1889
 Swift, L. G., Pittsfield. 1886
 Taylor, G. L., Holyoke. S
 Thompson, G. N., Boston. 1889
 Tobey, G. L., Lancaster. 1891
 Townsend, George J., South Natick. 1870
 Vaughan, Chas. E., Cambridge. 1884
 Vermeyne, J. J. B., New Bedford. 1880
 Ward, Rollin C., Northfield. S
 Warren, Charles E., Boston. 1884
 Warren, John C., Boston. 1889
 Warren, Joseph H., Boston. 1879
 Webber, F. W., Newton. 1883
 Weeks, A. P., Chelsea. 1880
 White, H. C., East Somerville. 1884
 White, H. W., Boston. 1891
 Williams, H. W., Boston.
 Williams, J. L., Boston. 1881
 Wolcott, Grace, Boston. 1887
 Wolcott, Henry P., Cambridge.
 Woodbridge, L. D., Williamstown. 1888
 Woods, J. Henry, Brookline. 1889
 Yale, John, Ware. 1889

MICHIGAN.

Albright, Joseph, Grand Rapids. 1888
 Alvord, A. W., Battle Creek. 1882
 Armstrong, O. S., Detroit. 1891
 Avery, John, Greenville. 1885
 Bachman, N. E., Stanton. 1883
 Baker, H. B., Lansing. 1874
 Barnes, H. B., Ionia. 1851
 Belknap, L. J., Alma. S
 Bell, J., Benton Harbor. 1874
 Bennett, E. O., Wayne. 1884
 Bliss, Lyman W., Saginaw. 1874
 Boise, Eugene, Grand Rapids. 1880
 Book, J. B., Detroit. 1870
 Brady, John, Grand Rapids. 1874
 Brainerd, I. M., Alma. 1890
 Breakey, W. F., Ann Arbor. 1877
 Briggs, Thomas H., Battle Creek. 1888
 Brumme, Carl, Detroit. 1874
 Buckham, J. N., Flint. 1883
 Buckham, T. R., Flint. 1874
 Carrow, F., Ann Arbor. 1891
 Carstens, J. H., Detroit. 1876
 Case, H. R., Grand Blanc. 1884
 Catlin, S. Jr., Tecumseh. 1889
 Chapin, E. P., Grass Lake. 1887
 Christian, E. A., Pontiac. S
 Christian, E. P., Wyandotte. 1876
 Cleland, Henry A., Detroit. S
 Connor, L., Detroit. 1874
 Davis, E. W., Saginaw. 1890
 Decamp, Wm. H., Grand Rapids. 1867
 Dellenbaugh, C. C., Portland. 1877
 Dickinson, W. L., East Saginaw. 1880
 Dock, Geo., Ann Arbor. 1890
 Donelson, G. P., Muskegon. 1885
 Dongan, W. T., Niles. 1889
 Drake, A. P., Hastings. 1883

Duffield, George, Detroit.
 Duffield, S. P., Detroit. 1883
 Dunlap, Harley M., Battle Creek. 1888
 Earle, G. W., Hermansville. 1878
 Eldred, J. N., Chesaning. S
 Elliott, J. M., Hickory Corners. 1881
 Emerson, J. E., Detroit. 1887
 Fairbank, H. C., Flint. 1873
 Fay, O. J., Carleton. 1890
 Florentine, F. B., Saginaw. 1886
 Frank, Chas. P., Detroit. 1883
 French, S. S., Battle Creek. 1877
 Frothingham, G. E., Detroit. 1874
 Fuller, D. E., Hastings. 1887
 Garwood, Alonzo, Cassopolis. 1887
 George, Conrad, Ann Arbor.
 Greene, J. H., Marshall. 1886
 Greenshields, Wm., Romeo. 1874
 Griswold, J. B., Grand Rapids. 1876
 Groner, F. J., Grand Rapids. 1884
 Hartz, H. J., Detroit. S
 Hazlewood, A., Grand Rapids. 1874
 Heath, G. F., Monroe.
 Hebard, E. A., Grand Rapids. 1884
 Herdman, W. J., Ann Arbor. 1883
 Hitchcock, C. W., Detroit. S
 Howell, George, Tecumseh. S
 Huber, C. G., Ann Arbor. 1890
 Inglis, David, Detroit. 1890
 Jenkins, J. F., Tecumseh. 1883
 Jenks, E. W., Detroit. 1863
 Jennings, Charles G., Detroit. 1888
 Jensen, P. C., Manistee. 1891
 Johnson, G. K., Grand Rapids.
 Kaiser, A., Detroit. 1876
 Kellogg, J. H., Battle Creek. 1882
 Kelsey, W. J., Cassopolis. 1883
 Kennedy, Stiles, St. Louis. 1890
 Kiefer, Hermann, Detroit. 1890
 Kimball, Amie G., Jackson. 1878
 Kimball, A. H., Battle Creek. 1889
 Kinne, A. F., Ypsilanti. 1887
 Knight, Amos, Eaton Rapids. 1884
 Laferte, Daniel, Detroit. 1888
 Langlois, T. J., Wyandotte. 1874
 Lathrop, Henry K., Royal Oak. 1884
 LeBaron, R., Pontiac. S
 Leonard, C. H., Detroit. 1891
 Lewis, C. H., Jackson. 1877
 Library Agricultural College, Agricul-
 tural College. S
 Lindsay, Kate, Battle Creek. 1886
 Lowry, G. W., Hastings. 1887
 Lundy, C. J., Detroit. 1883
 Lyster, H. F., Detroit. 1881
 McColl, H., Lapeer. 1874
 McDannell, C. C., Lowell.
 McGraw, T. A., Detroit. 1874
 McHench, W. J., Brighton. 1882
 McLeay, D., Prairieville. 1883
 McNair, Rush, Kalamazoo.
 Maclean, D., Detroit. 1875
 MacRae, John, Central Mine. 1890
 Maire, Lewis E., Detroit. 1887
 Mann, F. W., Detroit. 1891
 Medical Library University of Michi-
 gan, Ann Arbor. S
 Mellish, E. J., Ishpeming. S
 Metcalf, W. F., Detroit. 1890
 Mills, H. R., Port Huron. 1874
 Miner, S. G., Detroit. 1891
 Mulheron, J. J., Detroit. 1887
 Munson, J. D., Traverse City. 1878
 Murray, R. N., Flint. 1876
 Nichols, A. W., Greenville. 1883
 North, J. D., Jackson. 1874
 North, L. G., Tecumseh. S
 Palmer, E. A., Hartford. 1883
 Parker, Delos L., Detroit. 1888
 Patterson, P. D., Charlotte. 1878
 Pease, George C., Fulton. 1888
 Perkins, J., Owasso. 1882
 Phillips, H. H., Vandalia. 1882
 Pomeroy, E. H., Calumet. S
 Randall, I. E., West Bay City. 1887
 Ranney, G. E., Lansing. 1874
 Richardson, E. S., Reed City.
 Richmond, P. E., Mt. Pleasant. 1887
 Robinson, Wm. J., Lapeer. 1888
 Roller, L. S., Grand Rapids. 1883
 Rose, G. L., Decatur. 1881
 Rust, C. A., Saginaw. S
 Rutherford, F. A., Grand Rapids. 1890
 Sabin, M., Centreville. 1875
 Sackett, J. W., Prairieville. 1883
 Schaberg, H. H., Kalamazoo. 1887
 Scherer, O., Detroit. S
 Schurtz, Perry, Grand Rapids. 1883
 Scriber, W., Blissfield. 1883
 Seely, Oscar F., Climax. 1887
 Simpson, Irwin, Kalamazoo. 1887

Sheppard, Chas., Grand Rapids . . . 1884
 Shillito, Fred, Marcellus . . . 1890
 Shurley, E. L., Detroit . . . 1874
 Smith, E., Detroit . . . 1873
 Snook, J. M., Kalamazoo . . . 1880
 Southworth, C. T., Monroe . . . 1889
 Spencer, C. E., Fort Gratiot . . . 1874
 Sprague, Wm. B., Detroit . . . 1888
 Stockwell, C. B., Port Huron . . . 1887
 Strong, H. W., Byron Center . . . 1882
 Thomason, H. D., Albion . . . 1884
 Thompson, A. A., Flint . . . 1874
 Topping, G. W., DeWitt . . . 1872
 Towsley, Matilda M., Kalamazoo . . . 1888
 Van der Laan, J., Muskegon . . . 1887
 Vaughan, O. M., Covert . . . 1887
 Vaughan, V. C., Ann Arbor . . . 1883
 Voorhees, G. V., Coldwater . . . 1876
 Wade, D. C., Holly . . . 1887
 Walker, H. O., Detroit . . . 1880
 Walter, H., Eaton Rapids . . . 1884
 Welsh, D. E., Grand Rapids . . . 1884
 White, C. H., Reed City . . . 1887
 Williams, H., East Saginaw . . . 1883
 Wood, D. H., Quincy . . . 1887
 Worden, A. L., Detroit . . . 1883
 Wyman, Hal C., Detroit . . . 1878
 Wyman, Henry S., Morenci . . . S
 Yates, Albert, Washington . . . 1883
 Yates, James, Roseville . . . 1890

MINNESOTA.

Abbott & O'Brien, St. Paul . . . S
 Alden, C. H., St. Paul . . . 1880
 Alden, W., Duluth . . . S
 Aldrich, H. C., Minneapolis . . . S
 Allport, Frank, Minneapolis . . . S
 Amoss, E. X., St. Paul . . . S
 Anderson, J. D., Minneapolis . . . S
 Anker, A. K., St. Paul . . . 1891
 Anruss, P. A., Minneapolis . . . S
 Bacon, L. C., St. Paul . . . S
 Baker, J. F., St. Paul . . . 1882
 Bartlett, C. K., St. Peter . . . 1882
 Bedient, J., Kasson . . . 1877
 Beebe, L., St. Cloud . . . S
 Burton, F., Minneapolis . . . S
 Bell, J. W., Minneapolis . . . S
 Bell, M., Minneapolis . . . S
 Betts, W. W., Minneapolis . . . S
 Blackmar, F. A., Albert Lea . . . 1884
 Blair, W. H., Minneapolis . . . S
 Brimhall, J. D., St. Paul . . . S
 Bowrs, J., Minneapolis . . . S
 Bowers, J. E., Duluth . . . S
 Bowman, F. C., Duluth . . . S
 Boyer, S. H., Duluth . . . S
 Brooks, D. F., St. Paul . . . 1876
 Brown, E. J., Minneapolis . . . S
 Brunet, L. M., Duluth . . . S
 Buckley, E. W., St. Paul . . . S
 Byrnes, W. H., Minneapolis . . . S
 Calmus, G. M., Minneapolis . . . S
 Cates, A. B., Minneapolis . . . S
 Chilton, E. Y., Howard . . . 1886
 Clark, C. N., St. Charles P. O . . . S
 Coddling, Charles L., Duluth . . . S
 Cogwell, H. B., St. Paul . . . S
 Collins, D. F., Hinckley . . . S
 Collins, E. E., Duluth . . . S
 Conley, A. T., Cannon Falls . . . 1883
 Cooley, C. O., Madelia . . . S
 Coon, G. M., St. Paul . . . S
 Corson, Carroll, Duluth . . . S
 Craig, H. A., St. Paul . . . S
 Cusome, H., St. Paul . . . S
 Dahlstedt, N. G., Minneapolis . . . S
 Davis, H. S., Duluth . . . S
 Dedolph, T., St. Paul . . . S
 Dennis, G. E., Minneapolis . . . S
 Due, E., St. Paul . . . S
 Dunsnoor, F. A., Minneapolis . . . 1882
 Eustis, N. C., Owatonna . . . S
 Farnsworth, S. E., Minneapolis . . . S
 Fay, H. B., Minneapolis . . . S
 Ferris, C. M., Tracy . . . 1882
 Fisher, W. F., St. Paul . . . S
 Fitzsimons, W., St. Paul . . . S
 Fliesburg, A., St. Paul . . . S
 Flinn, W. D., Red Wood Falls . . . 1883
 Fulton, J. F., St. Paul . . . 1883
 Geer, E. F., St. Paul . . . S
 Giddings, A. N., Anoka . . . 1884
 Gilman, A. O., St. Cloud . . . 1882
 Glidden, C. H., St. Paul . . . S
 Goffe, W. G., Duluth . . . S
 Goodrich, A. T., St. Paul . . . S
 Gould, J. B., Minneapolis . . . S
 Graham, D. W., Duluth . . . S

Grant, J. G., Minneapolis . . . S
 Greenlee, D. R., St. Paul . . . S
 Griswold, C. H., St. Paul . . . S
 Gronwald, C., Norway P. O. . . . 1889
 Hahn, H., St. Paul . . . S
 Haines, B. P., St. Paul . . . S
 Hall, W. A., Minneapolis . . . S
 Hallowell, W. E., St. Paul . . . S
 Hanscom, W. H., Minneapolis . . . S
 Hart, E. S., Minneapolis . . . S
 Heflen, E. H., Minneapolis . . . S
 Hewitt, Charles N., Red Wing . . . 1882
 Hill, C., Pine Island . . . 1882
 Holmes, E. A., North St. Paul . . . 1886
 Horning, D. W., Minneapolis . . . S
 Hubbell & Spates, St. Paul . . . S
 Huutoon, A. F., West Duluth . . . 1886
 Hutchins, E. A., Minneapolis . . . S
 Irwin, A. W., Minneapolis . . . S
 Jachnig, Bruno, Red Wing . . . S
 Johnson, H. P., Houston . . . 1887
 Jones, D. N., Gaylord . . . S
 Jones, P. E., Red Wing . . . 1873
 Jones, Talbot, St. Paul . . . 1888
 Kelly, W. D., St. Paul . . . S
 Kimball, H. H., Minneapolis . . . 1886
 Knauf, M., Duluth . . . S
 Laws, F., Minneapolis . . . S
 Laton, W. S., Minneapolis . . . S
 Little, J. W., Minneapolis . . . 1887
 Lufkin, H. M., St. Paul . . . S
 Lundholm, E. M., St. Paul . . . S
 Lyng, J., Duluth . . . S
 McCormick, S. C., Duluth . . . 1879
 McEwan, S. W., Alexander . . . 1883
 McGaughey, J. B., Winona . . . 1872
 McGiffert, E. N., Duluth . . . S
 McGuire, F., St. Paul . . . S
 McLaren, A., St. Paul . . . 1887
 McMahon, W. R., Mankato . . . 1884
 McPherson, J. S., Brainerd . . . S
 Macdonald, J. H., Minneapolis . . . S
 MacNamara, J. G., St. Paul . . . S
 Magie, W. H., Duluth . . . S
 Maun, E. L., St. Paul . . . S
 Marcellas, T. M., Sleepy Dye . . . 1882
 Marchand, P., St. Paul . . . S
 Martel, Ovide, St. Paul . . . S
 Martindale, J. H., Minneapolis . . . S
 Maxwell, S. C., Duluth . . . S
 Mayo, W. W., Rochester . . . 1882
 Mikkelsen, M., Delavan . . . S
 Millard, P. H., St. Paul . . . 1881
 Miller, C. C., St. Paul . . . S
 Miller, C. T., St. Paul . . . S
 Mitchell, C. F., Minneapolis . . . S
 Montgomery, R., Minneapolis . . . S
 Morley, W. B., St. Paul . . . S
 Morlway, D. C., St. Paul . . . S
 Muckey, F. S., Minneapolis . . . S
 Mulholland, J. F., Jordan . . . S
 Murphy, J. H., St. Paul . . . 1877
 Murray, D. D., Duluth . . . S
 Neill, R. J., Minneapolis . . . S
 Norred, C. H., Minneapolis . . . S
 Noyes, A. A., Minneapolis . . . 1874
 O'Brien, P. P., Minneapolis . . . S
 Ohage, J., St. Paul . . . 1887
 Paxton, B. F., St. Paul . . . S
 Peunty, L. E., St. Paul . . . S
 Phelan, F. N., Duluth . . . S
 Pine, O. S., St. Paul . . . 1882
 Polk, W. R., Minneapolis . . . S
 Quinby, T. F., Minneapolis . . . S
 Quinn, J. A., St. Paul . . . S
 Ramsey, A. C. L., St. Cloud . . . S
 Ransome, S. W., Dodge Center . . . 1882
 Renz, G. N., St. Paul . . . S
 Richardson, F. W., St. Paul . . . S
 Richeson, W., St. Paul . . . S
 Ricker, G. E., Minneapolis . . . S
 Ritchie, A. F., Duluth . . . S
 Rosser, J. C., Brainerd . . . 1882
 Routh, G. E., St. Paul . . . S
 Routh, W. W., Duluth . . . S
 Schadle, J. E., St. Paul . . . 1889
 Scott, J. W., St. Charles . . . 1890
 Senkler, E. A., St. Paul . . . 1886
 Shaw, J. N., Minneapolis . . . S
 Sherwin, F. O., Duluth . . . S
 Shimonek, A., St. Paul . . . S
 Skaro, A. K., Minneapolis . . . S
 Slaughter, C., Duluth . . . S
 Smith, A., Minneapolis . . . S
 Smith, M. B., Minneapolis . . . S
 Solden, A. A., Minneapolis . . . S
 Salisbury, A. H., Minneapolis . . . S
 Staples, Franklin, Winona . . . 1871
 Staples, H. L., Minneapolis . . . S
 Steele, J. A., Minneapolis . . . S
 Stephens, W. O., Minneapolis . . . S

Steen, A. H., Cottage Grove . . . 1882
 Stinchfield, A. W., Eyota . . . 1875
 Stone, A. G., St. Paul . . . 1881
 Stone, J. J., Argyle . . . 1877
 Strickler, D. A., St. Paul . . . S
 Stuart, J. H., Minneapolis . . . S
 Sudduth, W. X., Minneapolis . . . 1889
 Swaine, G. D., Duluth . . . S
 Sweeney, A., St. Paul . . . S
 Tasker, C. H., Minneapolis . . . S
 Taylor, A. C., Duluth . . . S
 Tillier, P., St. Paul . . . S
 Twiford, W. H., Geneva . . . 1883
 Vanderherck, M. P., Minneapolis . . . S
 Vieregge, J. A., St. Paul . . . S
 Walker, James R., Excelsior . . . S
 Walrath, H. S., St. Paul . . . S
 Walsh, E. F., St. Paul . . . S
 Warner, C. F., Mankato . . . 1882
 Weeks, T. E., Minneapolis . . . S
 Weston, J. B., Duluth . . . S
 Wetherle, C. B., St. Paul . . . S
 Wheaton, G. A., St. Paul . . . 1882
 Whitcomb, A. L., St. Paul . . . S
 Whitstone, A. S., Minneapolis . . . S
 Whittemore, N. K., Elk River . . . 1884
 Williams, C., St. Paul . . . 1886
 Wirth, Chas., St. Paul . . . S
 Witherstine, H. H., Rochester . . . 1887
 Wood, G. S., St. Paul . . . S
 Wyatt, J. D., Minneapolis . . . S

MISSISSIPPI.

Brumfield, W. R., Magnolia . . . S
 Champlin, A. P., Pearlinton . . . 1887
 Cox, T. B., Learned . . . S
 Crook, H. L., Pelahatchie . . . S
 Duncan, B. A., West Point . . . 1884
 Ewing, C. C., Aberdeen . . . 1879
 Fullilove, F. W., Vaiden . . . 1887
 Gant, H. A., Water Valley . . . 1890
 George, B., Enterprise . . . 1885
 Greenlee, W. R., Harriston . . . S
 Guice, N. L., Natchez . . . 1884
 Guirry, N. D., Artesia P. O. . . . 1891
 Hall, J. C., Anguilla . . . 1877
 Howard, R. E., Durant . . . 1880
 Henderson, C. R., Deasonville . . . 1883
 Icard, Henry, Meridian . . . 1890
 Jordan, J. W., Black Hawk . . . 1885
 Kendall, W. T., Meridian . . . 1891
 Kittrell, B. F., Black Hawk . . . 1875
 Long, John, Coffadelliah . . . 1889
 McLean, J. L., Winona . . . 1890
 McNeill, M. J., Olive Branch . . . 1891
 Miller, M. V. B., Meridian . . . 1890
 Moore, J. P., Yazoo City . . . 1869
 Pease, J. B., Concordia . . . 1885
 Quinn, O. B., McComb . . . 1888
 Rowland, P. W., Coffeeville . . . 1886
 Sanford, W. B., Corinth . . . 1890
 Shackelford, J. A., Greenville . . . 1883
 Stewart, C. S., Scranton . . . S
 Taylor, J. M., Corinth . . . 1873
 Taylor, W. A., Booneville . . . 1879
 Toombs, R. S., Greenville . . . 1885
 Trimble, G. W., Grenada . . . 1890
 Vaughan, B. A., Columbus . . . 1872
 Walker, J. S., Greenville . . . 1885
 Weissenger, W. S., Hernando . . . 1891

MISSOURI.

Adams, C. W., Kansas City . . . 1887
 Allen, J. M., Liberty . . . 1886
 Allee, W. S., Olean . . . 1886
 Anderson, C. E., St. Louis . . . S
 Armstrong, G. M., St. Louis . . . S
 Atwood, Le Grand, St. Louis . . . 1884
 Barker, A., Bertrand . . . 1886
 Barnes, A. S., St. Louis . . . 1891
 Bennett, T. L., Kansas City . . . 1889
 Berghoff, J. T., St. Joseph . . . 1886
 Blank, A., St. Louis . . . S
 Block, J., Kansas City . . . 1888
 Bock, A. F., St. Louis . . . 1886
 Bogie, M. A., Kansas City . . . 1882
 Boisligniere, L. C., St. Louis . . . 1886
 Bond, J. A., Kansas City . . . 1886
 Bond, Y. H., St. Louis . . . 1886
 Bondurant, A. A., Charleston . . . 1883
 Borck, E., St. Louis . . . 1881
 Bottom, M., Breckenridge . . . 1885
 Boulware, T. C., Butler . . . 1885
 Brainerd, B. F., Kansas City . . . 1880
 Bremer, L., St. Louis . . . 1886
 Briggs, Waldo, St. Louis . . . 1890
 Brokaw, A. V. L., St. Louis . . . 1891

Brouson, I. T., Sedalia	1887	Laidley, L. H., St. Louis	1886	Von Quast, E., Kansas City	
Broome, Geo. W., St. Louis	1886	Lamoine, E. S., St. Louis	1886	Wallace, John, Brunswick	1886
Brown, Tinsley, Hamilton	1885	Laughton, W. T., Kansas City		Waters, R. C., Perryville	1886
Bryson, J. P., St. Louis	1886	Leavy, J. A., St. Louis	S	Wesseler, F. W., St. Louis	1876
Burke, J. S., Laclede	1887	Leeper, C. C., Braymer	1885	Wilson, W. B., Cape Girardeau	1885
Calloway, L. H., Nevada	S	Leonard, H. O., Kansas City	1887	Wood, J. B., Marshall	1886
Campbell, J. F., Callao	1886	Lester, C. H., Kansas City	1886	Yancey, E. F., Sedalia	1891
Carpenter, A. M., St. Louis	S	Lewis, B., St. Louis	1890		
Carpenter, S. F., St. Joseph	1890	Lewis, E. R., Kansas City	1885		
Carson, N. B., St. Louis	1886	Long, J. M., Rich Hill	1886		
Cathcart, Charles P., Kansas City	1887	Logan, J. E., Kansas City	1886		
Cave, E. S., Mexico	1886	Love, I. N., St. Louis	1883		
Chancellor, Eust., St. Louis	1887	Lutz, F. J., St. Louis	1886		
Chapman, A. W., East Prairie	1890	McCandless, W. A., St. Louis	1886		
Chastrain, E. M., Hume	1887	McClure, J., St. Louis	1886		
Coffee, J. Turner, Steelville	1878	McIntyre, J. H., St. Louis	1873		
Coles, W., St. Louis	1886	McKellop, J. H., St. Louis	1888		
Coryell, J. B., St. Louis	S	Mann, J. A., Wellington	1885		
Crow, A. M., Kansas City	1887	Marsh, J. T., Liberty	1877		
Curtman, George W., Koeltztown	1873	Martin, T. A., St. Louis			
Dabney, T. S., Kansas City	1885	Matthews, L. I., Carthage	1886		
Dalton, H. C., St. Louis	1887	Mayes, F. A., Malden	1891		
Davis, E. G., St. Louis	S	Mayger, John, St. Louis	1886		
Davis, Joseph B., Marshall	1889	Means, Wm. H., Marionville	1886		
Dean, D. V., St. Louis	1873	Med.-Chir. Society, St. Louis	S		
Denney, Z. C., Mt. Vernon	1886	Medlin, P. A., St. Louis	S		
DeVilbiss, Frank, Spring Garden		Magoffin, J., St. Louis	1854		
Dodge, R. K., Knoxville		Meisenbach, A. H., St. Louis	1886		
Douglass, W. H., Columbia	1882	Metcalf, W. A., Steelville	1885		
Doyle, T. H., St. Joseph	1878	Middlekamp, H. H., Warrenton	1886		
Duncan, J. H., Kansas City	1884	Miller, A. R., Macon	1886		
Ellis, T. B., Bethany	S	Miller, George W., Joplin	1885		
Engelmann, George J., St. Louis	1876	Miller, John J., Wellston	1885		
Evans, E. C., Sedalia	1886	Mitchell, D. L., Cassville	1885		
Evans, W. H., Sedalia	1880	Mitchell, W. F., Lancaster	1886		
Falk, J. C., St. Louis	S	Mooney, F. D., St. Louis	1886		
Fischel, W. E., St. Louis	1884	Moore, C., St. Mary			
Flanders, J. P., St. Louis	S	Moore, William G., St. Louis	1888		
Fleming, A. W., St. Louis	S	Morton, D. K., Missouri City	1891		
Ford, Ralph P., Jackson		Mosher, G. C., Kansas City	1890		
Foreman, J. M., Jonesburgh	1873	Mudd, H. H., St. Louis	1873		
Frelingsdorf, E. H., St. Louis	S	Mulhall, J. C., St. Louis	1886		
French, P., Mexico	1886	Mullen, Alex. J., St. Louis	1850		
Frumson, H., St. Louis	S	Nidelet, J. C., St. Louis	S		
Fulkerson, P. S., Lexington	1886	Nortou, J. J., Monroe City	1886		
Fuller, A. H., St. Louis	1886	Ohman-Dumesnil, A. H., St. Louis	1886		
Funkhouser, R. M., St. Louis	1884	O'Reilly, P. S., St. Louis	1873		
Fulton, A., St. Louis	1891	Outen, W. B., St. Louis	1873		
Fulton, A. L., Kansas City	1888	Overstreet, W. C., Sedalia	1886		
Furney, E. E., St. Louis	1886	Pearson, John S., Louisiana	1886		
Gant, J. O. K., Plattsburg	1886	Pollak, S., St. Louis	1882		
Gehrung, E. C., St. Louis	1886	Pollmann, L. P., St. Louis	1886		
Geiger, Jacob, St. Joseph	1883	Porter, David R., Kansas City	1888		
Gibbs, T. J., Proctor	S	Porter, W., St. Louis	1882		
Gill, G. F., St. Louis	1886	Post, M. H., St. Louis	1886		
Grinstead, W. Frank, Charleston	1885	Powers, Ed. M., St. Louis	1886		
Glasgow, F. A., St. Louis	1886	Prewitt, T. F., St. Louis	1882		
Glasgow, Wm. C., St. Louis	1875	Prichard, J. B., St. Louis	1890		
Gober, G. A., Kirksville	1886	Randall, L. J., St. Louis	S		
Godbey, W., Salem	1886	Redman, Spencer, Platte City	1885		
Goodier, R. H., Hannibal	S	Rieger, J. H., Kansas City	1886		
Goodrich, C. F., New Haven	1886	Richardson, N. S., Macon City	1887		
Gore, David C., Marshall	1886	Ridge, Isaac M., Kansas City	1890		
Graham, A. W., Holstein	1886	Riggs, T. S., Providence	1886		
Graves, S., St. Louis	1885	Robinson, A. C., St. Louis	1886		
Greene, W. C., St. Louis	1886	Robinson, P. G., St. Louis	1885		
Gregory, E. H., St. Louis	1872	Rohlfing, C. G., St. Louis	1886		
Griffith, J. D., Kansas City	1886	Rowe, H. J., Willow Springs	1890		
Griswold, S. C., New Haven	1886	Rowe, J. M., Charleston	1886		
Guhman, Nicholas, St. Louis	1886	Rowe, Samuel B., Rolla	1886		
Gundelach, W. J., St. Louis	1891	Ryan, J. F., St. Louis	S		
Hall, C. Lester, Kansas City	1882	Schaufler, E. W., Kansas City	1880		
Hall, L. T., Potosi	1885	Schlosstein, A., St. Louis	1886		
Halley, George, Kansas City	1878	Schultz, F. B., Cape Girardeau	S		
Hamilton, George, Auxvasse	1882	Schultz, H. B., St. Louis	S		
Hanawatt, H. O., Kansas City	1882	Scott, J. M., St. Louis	1873		
Hauck, E. F., St. Louis	1880	Sharp, Joseph, Kansas City	1888		
Hawkins, A. S., Cassville	1886	Shaw, A. B., St. Louis	1886		
Hearne, J. C., St. Joseph	1880	Simpson, A. E., Charleston	1888		
Henderson, R. T., Jackson	1880	Sloan, A. B., Kansas City	1879		
Hickman, Henry, St. Louis	1887	Smith, E. F., St. Louis	1886		
Highsmith, G. R., Carrollton	1887	Spiegelhalter, J., St. Louis	1886		
Hill, R. J., St. Louis	1884	Stanley, Z. T., Laclede	1887		
Holland, C. F., Keytesville	1886	Steer, Justin, St. Louis	1886		
Holtgrew, F. W., St. Louis	S	Taylor, T. B., St. Louis	S		
Houts, S. B., St. Louis	S	Tefft, J. E., Springfield	1882		
Howle, W. P., Oran	S	Thatcher, J. P., Pisgah	1886		
Hubbard, J. D., Versailles	1890	Thompson, C. A., Jefferson City	1887		
Hughes, C. H., St. Louis	1880	Thompson, J. E., St. Louis	S		
Hutton, E. L., Kansas City	S	Thompson, J. H., Kansas City	1885		
Hypes, B. M., St. Louis	1885	Thompson, W. E., St. Louis	S		
Irwin, T., Moberly	1884	Tiffany, F. B., Kansas City	1884		
Isbell, J., Washington	1886	Todd, C. A., St. Louis	1886		
Jackson, T. B., Kansas City	1886	Todd, S. S., Kansas City	1873		
Johnson, F. M., Kansas City	1885	Trader, J. W., Sedalia	1873		
Jordan, R. M., St. Louis	1881	Tuholske, H., St. Louis	1885		
Keir, Wm. F., St. Louis	1886	Tupper, P. Y., St. Louis	1886		
King, Willis P., Kansas City	1884	Tyree, W. C., Kansas City	1886		
Knapp, G. L., Mt. Vernon	S	VanEman, J. H., Kansas City	1884		
Kolbenberger, Fred, St. Louis	1886	Van Note, E., Hamilton	1885		
Kuhn, D., St. Louis	1886	Vaughan, J. P., Glasgow	1891		

MONTANA.

Allen, Wm., Philipsburg	S
Campbell, W. H., Livingston	
Hillmantel, J. L., Missoula	S
Holmes, L. E., Battle City	1891
Miller, C. B., Helena	1880
Moore, M. B., Bannock City	1891
Ray, Wm., Philipsburg	S
Welles, G. R., Livingston	S

NEBRASKA.

Ames, L. L., Chester	
Anderson, A. B., Pawnee City	1886
Armstrong, J. T., Beatrice	S
Billings, Frank S., Lincoln	
Brackett, A. B., Wakefield	1882
Bradley, C. A., Beatrice	1890
Brother, Ferd., Beatrice	1876
Bryant, DeWitt C., Omaha	1890
Bush, J. C., Wahoo	1888
Butler, F. A., Harvard	1890
Carter, J. O., Lincoln	1882
Casebeer, H. M., Lincoln	
Claussen, J. E., Omaha	S
Coffin, C. E., North Loup	1891
Coffman, V. H., Omaha	1882
Cook, C. C., David City	1885
Crandall, Alice H., Lincoln	1884
Crummer, B. F., Omaha	1882
Cushman, H., Stromsburg	1884
Dawson, J. O., Lincoln	1883
Denise, J. C., Omaha	1886
Donaldson, N. F., North Platte	1891
Duncan, K. L., DeWitt	1884
Easton, C. M., Hebron	1889
Farnham, G. O. W., Lincoln	S
Fletcher, E. R., St. Paul	S
Galbraith, W. J., Omaha	1886
Gapen, C., Omaha	1883
Garten, M. H., Lincoln	1889
Green, C. C., Beaver City	S
Haggard, J. R., Lincoln	1890
Haldeman, F. D., Ord	1884
Harrington, H. E., Bertrand	1890
Harris, Wm. J., Beatrice	1890
Hildreth, M. L., Lyons	1890
Humphreys, G. L., Kearney	1878
Johnston, Geo. W., Fairmount	1887
Kirkpatrick, M., South Omaha	S
Knapp, W. M., Asylum	1882
Knapp, Wm. M., Lincoln	
Lane, T. H., Lincoln	1887
Lee, Edward W., Omaha	1882
Link, H., Millard	1880
Linn, W. S., York	1887
Livingston, Theo. P., Plattsmouth	1887
Long, F. A., Madison	1890
Lord, John P., Omaha	1887
McConaughy, Robert, York	1880
McKinley, J. C., Leigh	S
Mansfelde, A. S. V., Ashland	1884
Miles, J. D., Schuyler	1882
Mitchell, J. W., Superior	1884
Moore, R. C., Omaha	1882
Neal & Son, Peru	S
Peabody, J. H., Omaha	1870
Peebles, G. H., Lincoln	1885
Pritchett, G. L., Fairbury	1884
Quinn, John H., Blue Spring	1888
Rosewater, C., Omaha	1890
Sanders, S. F., Holdrege	1875
Shidler, G. W., York	1888
Shipman, A., Plattsmouth	1884
Simmons, G. H., Lincoln	S
Smith, E., Burchard	1884
Smith, L. B., Fremont	1885
Saulding, S. K., Omaha	1890
Summers, John E., Jr., Omaha	1887
White, Lizzie K., Sparks	1886
White, W. S., Palmyra	1885
Woodward, T. H., Lincoln	1890

NEVADA.

Montezuma, C., White Rock	S
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NEW HAMPSHIRE.

Adams, Daniel S., Manchester	1889
Aldrich, W. H., Marlboro	1889

Allen, Bradford, Nashua 1889
 Berry, J. J., Portsmouth 1887
 Burnham, H. B., Manchester 1889
 Carville, H. D. W., Manchester 1889
 Conn, G. P., Concord 1880
 Evans, E., Winchester 1880
 Ford, S. W., Mt. Vernon S
 Gove, Geo. S., Whitefield 1884
 Graves, E. E., Boscawen 1884
 Ground, E. Meigs, Bartlett S
 Hill, Levi G., Dover 1876
 Horsch, Carl, Dover 1886
 Hyland, Jesse B., Keene 1889
 Jones, D. W., Portsmouth 1884
 Lathrop, M. C., Dover 1881
 Leach, T. W., New Market 1878
 McQuesten, E. F., Nashua 1881
 Parsons, J. W., Portsmouth 1870
 Porter, W. B., Walpole 1884
 Prouty, Ira J., Keene 1889
 Richardson, A. P., Walpole 1880
 Sanborn, T. B., Newport 1884
 Watson, Irving A., Concord 1884
 Weymouth, H. A., Andover 1881
 Wilkins, W. W., Manchester 1889

NEW JERSEY.

Allen, U., Jersey City Heights 1890
 Ash, H. St. Clair, Atlantic City 1880
 Baldwin, H. R., New Brunswick 1889
 Balleray, Geo. H., Patterson 1884
 Bayles, G., Orange 1884
 Benjamin, D., Camden 1884
 Bradshaw, J. H., Orange 1891
 Braymer, O. W., Camden 1891
 Buckingham, H. G., Clayton 1887
 Burns, E. L., Newark 1891
 Carpenter, A. E., Boonton 1870
 Coit, Henry L., Newark 1889
 Cook, H. G., Holmdel 1884
 Currie, D. A., Englewood 1876
 Davis, W. A., Camden 1884
 Dickinson, G. K., Jersey City 1880
 Disbrow, Wm., Newark S
 Donges, J. W., Camden 1884
 Edge, B., Jersey City 1891
 Elmer, Wm., Trenton 1891
 English, D. C., New Brunswick 1870
 Elmer, H. W., Bridgeton 1884
 Fitch, Thos. S. P., Orange 1889
 Gillson, M. W., Paterson S
 Godfrey, E. L. B., Camden 1881
 Green, J. S., Elizabeth 1872
 Gross, O. B., Camden 1880
 Haydon, J. H., Newark S
 Herzog, H., Hoboken 1891
 Hibbard, Wm. E., Ridgefield Park 1890
 Hinkley, L. S., Newark 1887
 Hough, H. Page, Rahway 1889
 Ill, Charles L., Newark S
 Ill, Ed. J., Newark 1887
 Johnson, W. B., Patterson 1891
 Jousett, A., Paterson S
 Kornemann, H. A., Newark 1888
 Kraemer, C. F., Newark S
 Love, John J. H., Montclair S
 McAllister, Alexander, Camden S
 McClellan, E. S., Paterson 1891
 McGill, J. D., Jersey City 1872
 Mackintosh, M. A., Paterson 1891
 Mandeville, C. D., Newark S
 Mathewson, W. B., Somerville 1889
 Nadler, F. C., Newark S
 Neer, H. C., Park Ridge 1890
 Parrish, Joseph, Burlington 1847
 Passaic Co. Med. Soc., Paterson S
 Peacock, R. W., Jersey City S
 Peck, George, U. S. N., Elizabeth 1884
 Pettitt, A., Elizabeth 1891
 Pierson, Wm., Orange 1876
 Probasco, John H., Plainfield 1888
 Quimby, J. N., Jersey City 1872
 Ransom, Anson R., South Orange 1887
 Reed, B., Atlantic City 1884
 Reeves, D. L., Jersey City S
 Ryerson, J. G., Boonton 1891
 Skinner, D. M., Belleville 1880
 Smith, D. W., Newark 1876
 Smith, Fayette, Newark 1883
 Southard, L., Newark 1876
 Stanwood, R. S., Newark 1891
 Stiger, John S., Mendham S
 Stockton, Charles S., Newark 1889
 Taylor, H. G., Camden 1870
 Taylor, Wm. H. O., Weehawken 1888
 Terry, J. W., Englewood 1887
 Tetreault, F. J. E., Orange 1889
 Tickenor, H. H., Newark 1880
 Van Riper, C., Passaic S

Van Riper, C. S., Paterson S
 Varick, T. R., Jersey City S
 Vogler, Charles, Newark 1887
 Voorhees, C. H., New Brunswick 1887
 Vreeland, Fr. D., Paterson S
 Waddington, B. A., Salem 1890
 Ward, Arthur, Newark 1889
 Watson, B. A., Jersey City 1872
 Watson, W. P., Jersey City 1889
 Way, Eugene, Dennisville S
 Welsh, G. T., Passaic 1884
 Whittaker, J. S., Millville S
 Wikoff, J. H., Princeton 1884
 Williamson, N., New Brunswick 1880
 Wrightson, J. T., Newark 1884

NEW MEXICO.

Kaster, J. B., Albuquerque 1888
 Kohlhausen, C. B., Raton S
 Stephens, E. L., Silver City 1890
 Tipton, W. R., Las Vegas 1883
 Winslow, C. E., Albuquerque 1887

NEW YORK.

Aberdain, R., Syracuse S
 Adams, F. A., Syracuse S
 Adams, J. C., New York S
 Ainsworth, H. R., Addison 1879
 Allan, G. S., New York 1891
 Anderson, J. H., New York 1884
 Anderton, W. B., New York 1883
 Andrews, J. B., Buffalo 1884
 Archambeault, L. J., Troy S
 Armstrong, S. T., New York 1885
 Arnold, E. S. F., New York 1863
 Aronson, M., New York S
 Atkinson, W. H., New York S
 Ayres, D., Fort Plain S
 Babcock, H. D., Syracuse S
 Babcock, R., Albany S
 Bacon, C. G., Fulton 1855
 Bailey, T. P., Albany S
 Bangs, D. B., New York 1880
 Barker, A., New York S
 Barker, J. F., Albany S
 Barry, D. J., Schenectady S
 Bartlett, J. W., New York S
 Barney, G. D., Brooklyn S
 Bassett, J. N., Jr., Canton S
 Bates, G. W., Schenectady S
 Bates, Xyris, Poughkeepsie 1885
 Baynes, Joseph E., Troy S
 Baynes, Wm., Troy S
 Bell, A. N., Brooklyn S
 Bellows, G. A., Waterloo 1891
 Benham, J. C., Hudson 1884
 Bennett, T. W., Jeffersonville 1885
 Benson, R. F., Troy S
 Benton, J. W., Ogdensburg S
 Bigelow, J. M., Albany S
 Biggs, H. W., New York 1884
 Billington, C. E., Syracuse S
 Billings, G. H., Cohoes S
 Birsall, G. N., Brookfield 1880
 Bischof, L. F., New York S
 Bishop, H. M., S. Brooklyn 1882
 Bissell, J. H., Troy S
 Blake, G. A., Watertown S
 Blatner, J. H., Albany S
 Bleyer, J. M., New York 1889
 Bloodgood, D., Brooklyn S
 Blumenthal, M., New York 1880
 Bodkin, D. G., Brooklyn 1876
 Bonesteel, H. F., South Troy S
 Booth, B. S., Troy S
 Booth, W. H., Utica S
 Bontecou, R. B., Troy 1853
 Bos Kowitz, G. W., New York S
 Bosworth, F. H., New York 1884
 Boyd, James P., Albany 1880
 Bozeman, N., New York 1884
 Bradford, T., Syracuse S
 Briggs, A. H., Buffalo 1884
 Briggs, C. G., Schenectady S
 Brooklyn E. D. Homeo. Dis'y, Brooklyn S
 Brooks, F. D., Syracuse S
 Brown, Higgins, Syracuse S
 Brown, John, New York S
 Brown, S. E., Ogdensburg S
 Brown, V., Yonkers S
 Brown, W. J., Mottville 1880
 Brownlow, J. H., Ogdensburg S
 Brunner, W. J., New York S
 Brush, E. F., Mt. Vernon 1884
 Buckbee, I. I., Fonda S
 Buckland, B. I. C., Fleming 1891
 Buckley, H. N., Delhi 1889

Buffington, C. E., Pawling S
 Bulkeley, L. D., New York 1874
 Bullet, J. B., New York S
 Bumstead, C. S., New York S
 Burbeck, C. H., Troy S
 Burchard, T. H., New York 1880
 Burge, J. H. H., Brooklyn 1887
 Burrell, D. R., Canandaigua 1878
 Burrell, F. A., New York 1872
 Burton, M. H., Troy S
 Bushnell, R. A., Little Falls S
 Butler, F. H., Syracuse S
 Byrne, P. J., New York S
 Callan, P. A., New York S
 Capron, A. S., Albany S
 Carlucci, F., New York S
 Carpenter, H. W., Oneida 1885
 Carr, H. A., Binghamton S
 Carroll, Alfred L., New York 1889
 Case, M., Ontario 1891
 Case, Walt. R., Poughkeepsie S
 Catlin, A. W., Brooklyn S
 Cecil, Thomas, New York S
 Chamberlayne, J. K., Utica 1884
 Chase, C. E., Utica S
 Clark, A., New York S
 Clark, E. P., Utica S
 Clarke, W., Utica S
 Classen, F. L., Albany S
 Clute, W. T., Schenectady S
 Coakley, J. B., Buffalo 1883
 Cock, S. F., New York 1848
 Colton, E., Yonkers S
 Colvin, D., Clyde 1878
 Contant, J. E., Poughkeepsie S
 Conway, H. A., New York S
 Cook, Chas. D., Brooklyn 1886
 Cook, C. P., Hudson S
 Cooper, C. S., Syracuse S
 Cooper, Wm. C., Troy S
 Cramer, Wm., Poughkeepsie S
 Crawford, C. H., Albany S
 Creveling, J. P., Auburn 1890
 Cronson, R., New York S
 Cronyn, John, Buffalo 1878
 Crook, J. K., New York S
 Crowley, M. F. J., New York S
 Culver, E. M., New York S
 Currie, T. J., New York S
 Curtis, H., New York 1889
 Custin, W. D., Syracuse S
 Cutter, E., New York 1871
 Cutter, John A., New York 1888
 Dagenais, A., Buffalo 1884
 Daggett, B. H., Buffalo 1886
 Dallas, A. J., Syracuse S
 Danforth, I. L., New York S
 Daniels, C. M., Buffalo 1884
 Davis, Wm., Gloversville S
 Dav s, W. R., Utica S
 DeBaun, C. W., Fonda S
 De Garmo, Wm. B., New York 1889
 Delavan, B., New York S
 Deming, L. P., Syracuse S
 Denison, C. E., New York 1889
 Dennis, F. S., New York 1883
 Deshon, R., New York S
 Deuell, E. V., Saratoga S
 DeWitt, Byron, Oswego 1876
 De Zouch, Isaac, Gloversville 1885
 Dickinson, M. D., Troy S
 Didama, H. D., Syracuse 1864
 Dolley, Sarah R. A., Rochester 1889
 Donnelly, J. M., Lansingburgh S
 Douglas, E. H., Little Falls S
 Douglas, Geo., Oxford 1889
 Douglass, H. O., Little Falls S
 Doyle, G., Syracuse 1880
 Drake, D. D., Johnstown S
 DuBois, W. C., Syracuse S
 Dudley, A. P., New York 1884
 Dunboe, N. T., Binghamton S
 Dunham, O., Irvington-on-Hudson 1889
 Durant, G., New York 1876
 Duryea, C. C., Schenectady S
 Dwyer, M. J., Albany S
 Eastman, W. L., Albany S
 Eccles, R. G., Brooklyn 1888
 Edwards, A. S., Syracuse 1878
 Edwards, G. A., Syracuse 1884
 Edwards, J., Gloversville S
 Ellinwood, A. G., Attica 1880
 Elliott, E., New York 1880
 Elliott, S. R., New York S
 Elmore, W. L., New York S
 Evans, George A., Brooklyn 1888
 Eynon, W. G., New York S
 Fairbank, J. R., Amsterdam S
 Fairchild, M. B., Syracuse S
 Farmer, G. S., Watertown S
 Farnham, LeRoy D., Binghamton 1881

Farrington, J. M., Binghamton	1889	John, David, Yonkers	S	Murray, D. H., Syracuse	1891
Fell, George E., Buffalo	1889	Johnson, R. G., Amsterdam	S	Murray, W. H., Albany	S
Felter, M., Troy	S	Johnson, T. M., Buffalo	1884	Myers, S. Oscar, Mt. Vernon	1889
Fennemore & Barnette, Potsdam	S	Johnson, W. L., Johnstown	S	Nefel, W. B., New York	1870
Fennott, Henry M., Rochester	1889	Jolks, D. P., Binghamton	S	Nelson, Wolfred, New York	S
Ferguson, E. D., Troy	1880	Judson, A. B., New York	1876	Newman, R., New York	1872
Finder, Wm., Jr., Troy	S	Kathan, D., Schenectady	S	Newton, E. T., New York	S
Fisk, E. J., Troy	S	Keenan, M., Troy	S	Nichell, H., Buffalo	1863
Fitch, H. A., Utica	S	Kempe, J. J., Rochester	1883	Nicoll, H. D., New York	1883
Flandrau, T. M., Rome	1878	Kenny, A. G., West Troy	S	Nidelet, S. L., Ogdensburg	S
Flanigan, J. R., Syracuse	S	Kenyon, Frank, Scipio	1880	Nolan, John, New York	S
Fleischman, D., Albany	S	Kilbourne, J. G., Utica	S	North, N. L., Brooklyn	1885
Flint, A., New York	1860	King, C. M., Cohoes	S	Noyes, H. D., New York	1864
Flint, E. H., Syracuse	S	King, Ferdinand, New York	1890	N. Y. Hospital Library, New York	S
Folwell, M. B., Buffalo	1878	Kinget, T. R., New York	S	O'Brien, J. C., Amsterdam	S
Forbes, W. H., Richmond Hill	1888	Kittinger, M. G., Lockport	1883	O'Brien, M. C., New York	1891
Fordyce, B. A., Union Springs	1880	Knapp, J. A., Mt. Vernon	S	O'Brien, R. W., Peekskill	S
Forest, W. E., New York	S	Knapp, W. H., Binghamton	S	O'Leary, D. V., Albany	S
Foster, A. B., Fonda	S	Kneuper, Fr. J., New York	S	Ormsby, Robt., New York	S
Fowler, A., Albany	S	Knight, Charles, New York	S	Orton, J. G., Binghamton	1883
Fowler, George R., Brooklyn	1880	Korner, C. F., New York	S	Owen, Mary, Brooklyn	1890
Frauenstein, G., New York	S	Kuintzer, Robt., New York	S	Owen, S., Syracuse	S
Frederick, C. C., Buffalo	1888	La Moure, U. B., Albany	S	Page, B., New York	S
Freeland, N. H., Tarrytown	1876	Landon, N. E., Newark	1885	Page, R. C. M., New York	1881
Freeman, R. G., New York	S	Lang, L., New York	S	Palmer, C. N., Lockport	1878
French, S. H., Amsterdam	1883	Larkin, E. E., Albany	S	Palmer, R. J., Gloversville	S
Freudenthal, W., New York	S	Lay, James C., New York	S	Park, Roswell, Buffalo	1877
Furman, J. H., Tarrytown	S	Leale, Charles A., New York	1876	Pars ns, John, Kings Bridge	1880
Gale, H. G., Gloversville	S	Leaming, J. R., New York	1880	Pease, H. H., Syracuse	S
Gallivan, J. W., New York	S	Leaning, J. K., Cooperstown	1884	Peckham, A. G., Waterford	S
George, A. L., Albany	S	Lehmann, Henry, New York	S	Peirce, G. L., New York	S
Gibbons, P. J., Syracuse	S	Lempe, G. G., Albany	S	Perry, John G., New York	1872
Gibney, Virgil P., New York	1881	Leo, S. F., Cohoes	S	Perry, N. M., Troupsburgh	1885
Gihon, Albert L., Brooklyn	1876	Lester, E., Seneca Falls	1889	Peters, S., Cohoes	S
Gladman, G. J., Syracuse	S	Lewengood, Dr., New York	S	Phelps, W. C., Buffalo	1878
Glenny, Mrs. E. A., Buffalo	S	Lewis, M. J., Albany	S	Phillips, J., Gloversville	S
Gleitsmann, J. W., New York	1879	Liberneau, C., New York	S	Pilcher, L. L., Brooklyn	S
Gliden, Charles H., Little Falls	1889	Leighton, N. W., Brooklyn	1885	Pitts, A. F., East Schodack	S
Glover, F. R., Mt. Vernon	S	Lincoln, D. F., Geneva	1889	Planck, M. G., Schenectady	S
Goetz, W., New York	S	Lindke, S. E., New York	S	Porteous, J. G., Poughkeepsie	S
Goodwillie, D. H., New York	S	Lloyd, T. M., Brooklyn	S	Post, J. R., Rome	S
Goudie, R. G., Troy	S	Long, A. J., Whitehall	1878	Potter, L. C., New York	S
Gouley, J. W. S., New York	1873	Lundgren, C. E., Jamestown	1886	Potter, W. W., Buffalo	1878
Govan, Wm., Stony Point	1860	Lung, J. B., Brooklyn	1889	Preston, B. I., Rochester	1883
Gray, P. J., Utica	S	Lusk, W. T., New York	1884	Preston, J. C., Canton	S
Green, J. W., West Laurens	S	Lyman, E. S., Sherburn	1876	Price, G. M., Syracuse	S
Greenberg, S., New York	S	Lynch, Charles J., New York	S	Price, H. R., Brooklyn	S
Greene, F. R., Albany	S	Lyons, T. D., New York	S	Purple, S. S., New York	1884
Greenman, C. E., Troy	S	McCarroll, H. B., New York	S	Pyne, P. H., Yonkers	S
Grubb, R. K., Poughkeepsie	S	McChesney, James, Troy	S	Quinlan, J. W., Fort Plain	S
Hager, J. A., Gloversville	S	McClay, C. E., Syracuse	S	Quirk, D. J., New York	S
Hagey, J. M., Mt. Morris	1889	McCollom, Wm., Brooklyn	1889	Rand, H. W., Brooklyn	S
Hailes, Willard, Albany	S	McDonald, C. M., Binghamton	S	Ransom, H. B., New York	S
Halbert, H., Canastota	S	McEncroe, J. F., Schenectady	S	Raymond, J. H., Brooklyn	S
Hall, Nelson F., Fulton	S	McGillicuddy, T. J., New York	1891	Reynolds, F., Syracuse	S
Hammer, Charles, Schenectady	1889	McKay, J. S., Potsdam	S	Reynolds, J., Potsdam	S
Hamilton, A. M., Brooklyn	S	McLean, LeRoy, Troy	1870	Richards, M., Oswego	S
Hamington, D. W., Buffalo	S	McLeod, S. B. W., New York	1872	Ridlon, John, New York	S
Hanchett, J. E., Syracuse	S	McNaughton, W. M., West Troy	S	Rives, W. Cabell, New York	1889
Hanchett, R. C., Syracuse	S	Macfarlane, R. F., Albany	S	Robb, W. H., Amsterdam	1878
Hannon, J. C., Hoosac Falls	1880	Mallory, M. L., Rochester	S	Roberts, C. S., Syracuse	S
Harrer, W. J., Utica	S	Manley, Thomas H., New York	1889	Robinson, A. R., New York	1886
Harrison, G. T., New York	1881	Mann, E. C., New York	S	Roe, J. O., Rochester	1880
Hart, J. F., Elmira	1876	Mansfield, J. F., Watertown	S	Rogers, H. R., Dunkirk	1868
Hawes, W. A., New York	S	Marcuse, A., New York	S	Root, A. L., New York	S
Heffler, G. O., New York	S	Marrill, J., Poughkeepsie	S	Rosenheim, M., New York	S
Hendricks, H. C., McGrawville	1876	Marsden, W. R., Utica	S	Ross, J. W., Cohoes	S
Henry, S., Millbrook	S	Marsh, James P., New York	1887	Roth, J. C., Syracuse	S
Higgins, J. F., New York	S	Marshall, J. F., Brooklyn	S	Ruggles, A. D., New York	1889
Hinton, J. H., New York	1876	Martine, Godfrey R., Glens Falls	1887	Rulison, E. E., Amsterdam	S
Hodgeman, Abbott, New York	1889	Martinez, W. H., Syracuse	S	Rushmore, J. D., Brooklyn	S
Hoffman, J. E., Lansingburgh	S	Medical Dept. University of Buffalo, Buffalo	S	Sachs, Julius, New York	S
Holding, G. W., West Troy	S	Meding, C. B., New York	S	Sapiro, N., New York	S
Holmes, Martha C., New York	1889	Meier, G. C. H., New York	1889	Sawyer, Count, Auburn	1889
Hopkins, I. D., Utica	S	Mercer, D. A., Syracuse	1878	Sayre, L. A., New York	1848
House Staff Manhattan Eye and Ear Hosp., New York	S	Meyer, L. T., New York	S	Sayre, R. H., New York	1887
Hovey, B. L., Rochester	1876	Miles, C. A., Yonkers	S	Schmidt, H. E., White Plains	1880
Hubbard, S. T., New York	1880	Miles, G. W., Oneida	S	Schoolcraft, J. L., Schenectady	S
Hubbell, A. A., Buffalo	S	Miller, A. B., Syracuse	S	Schoonevor, W., New York	1860
Hudson, W. G., New York	S	Miller, J. J., Amsterdam	S	Schopin, E., Yonkers	S
Huhne, Aug., Rondout	S	Minard, Eliza J. C., Brooklyn	1889	Seabury, J. H., Yonkers	S
Hun, Thomas, Albany	1853	Minsky, D. S., New York	S	Seaman, F. G., Seneca Falls	1889
Husted, N. G., Tarrytown	1856	Mitchell, J. H., Cohoes	S	Sears, F. W., Syracuse	S
Hyland, E. M., Utica	S	Mooney, E. L., Syracuse	S	Seibert, A., New York	1891
Hyland, T. G., Amsterdam	S	Moore, E. M., Rochester	1849	Selden, Robert, Catskill	1889
Ingraham, C. W., Binghamton	S	Moore, J. J., Syracuse	S	Sell, E. H. M., New York	1867
Irwin, Fairfax, Buffalo	1889	Moore, W. J., Cortland	S	Seymour, W. P., Troy	1877
Isaacs, N. E., New York	S	Moran, James, New York	S	Seymour, W. W., Troy	1884
Ives, G. H., Watertown	S	Moritz, Ed. H., New York	S	Sharer, John P., Little Falls	1880
Jackson, C. O., Victor	1884	Morrill, F. D., Albany	S	Shaw, E. S. D., Brooklyn	S
Jacobson, N., Syracuse	1890	Morris, J. W., Troy	S	Sheedy, D. M., Poughkeepsie	S
Jacobus, A. M., New York	1889	Morris, R. T., New York	1889	Sheedy, William F., New York	S
James, W. M., Utica	S	Morse, Samuel S., New York	S	Sheldon, A. F., Lyons	1889
Jamison, J. A., Hornellsville	1885	Morton, W. J., New York	S	Shepard, C. H., Brooklyn	1890
Janvrin, J. E., New York	1880	Mosten, G. T., Albany	S	Sheppey, J. V., Albany	S
Jarvis, W. C., New York	1881	Moxon, D. C., Bloomingburg	S	Sherer, J. D., Waterford	S
Jarvis, J. L., Syracuse	S	Mulvey, N. L., Syracuse	S	Shoudy, T. L., Syracuse	S
Jenkins, N. E., Auburn	1881	Mumford, E. S., Syracuse	S	Shrady, J., New York	1880
Jeschinsky, L., Mt. Vernon	S	Munn, C. A., Kingston	S	Silver, H. M., New York	1880
Jewett, H. O., Cortland	S	Munn, J. P., New York	1883	Simonet, S. E., Croghan	S
				Simons, F. E., Conajoharie	S

Sizer, N. B., Brooklyn	S	Winne, L. B., Albany	S	Cassett, M., Cincinnati	1888
Skinner, S. A., Hoosic Falls	1883	Wood, Wm. W., Gloversville	S	Chapman, B., Copley	S
Slater, F. E., Binghamton	S	Woodend, W. D., Huntington	1884	Chapman, W. C., Toledo	1888
Smith, A. S. & Son, Watertown	S	Wollman, M., New York	S	Cincinnati Hosp. Library, Cincinnati	S
Smith, C. B., Binghamton	S	Wright, J., Brooklyn	1891	Clark, J. H., Mechanicsburg	1888
Smith, F. W., Syracuse	S	Wunderlich, F. W., Brooklyn	1880	Clark, M. S., Youngstown	1883
Smith, G. M., New York	1858	Wyckoff, C. C., Buffalo	1863	Cleveland, John L., Cincinnati	1889
Smith, H. H., Hudson	S	Wyckoff, R. M., Brooklyn	1889	Cline, J. B., Perins Mills	1888
Smith, J. E., Albany	S	Wyeth, J. A., New York	1891	Coleman, N. R., Columbus	1886
Smith, J. L., New York	1880	Wylie, W. Gill, New York	1876	Collamare, G. A., Toledo	1883
Smith, Max M., New York	S	Wynderse, H. V., Schenectady	S	Collins, Milton H., South Charleston	1888
Smith, Hamburg S., New York	1850	Young, John, Fishkill-on-Hudson	S	Comegys, C. G., Cincinnati	1884
Smith, Stephen, New York	1884	Young, J. K., Johnstown	S	Conklin, S. A., Canton	1873
Smyth, A. V. H., Amsterdam	S	Zabriskie, W. H., Glen Cove, L. I.	1891	Conklin, W. J., Dayton	1878
Snyder, E. F., Binghamton	S	Zeh, Edgar, Waterford	S	Conner, P. S., Cincinnati	1867
Solow, Julius, New York	S	Zwishon, S. W., New York	S	Conrad, George R., New Vienna	1886
Spiegel, J. C., Schenectady	S			Cook, George F., Oxford	1886
Spitzka, E. C., New York				Corson, J., Middletown	1883
Squibb, E. H., Brooklyn	1889			Cosgrove, T. M., Auburndale	1881
Squibb, E. R., Brooklyn	1860			Corson, O. M., Middletown	1881
Steele, T. F., New York	S			Craig, G. W., Mansfield	1878
Steenburg, H. W., Green Island	S			Craig, J. Harvey, Mansfield	1888
Steiger, E. & Co., New York	S			Crossland, J. C., Zanesville	1891
Steiglitz, E., New York	S			Culbertson, E., Havana	1878
Stein, A. W., New York	1870			Cushing, H. K., Cleveland	1878
Stein, Julius, New York	S			Custer, L. E., Dayton	S
Stephens, George, New York	S			Cutler, Mary M., Pomeroy	1883
Stern, H., New York	S			Dandridge, N. P., Cincinnati	1888
Sternberg, B. U., Albany	S			Davis, Wm. B., Cincinnati	1875
Sternberg, C. A., Gloversville	S			Dawson, W. W., Cincinnati	1888
Stewart, James A., Yonkers	1884			De Vilbiss, A., Toledo	1888
Still, D. V., Johnstown	S			Dickes, Philip, Greenville	1888
Stockton, C. G., Buffalo	1888			Dickey, T. A., Middletown	1888
Stoughton, James, Lansingburgh	S			Dimmick, O. A., Chardon	1888
Stout, O. C., Syracuse	S			Dimond, H. C., Springfield	1891
Stover, Charles, Amsterdam	S			Dowling, F., Cincinnati	1883
Strauser, C. P., New York	S			Duncan, J. A., Toledo	1883
Streeter, H. S., Canajoharie	S			Dunham, Wm. H., Cincinnati	1888
Strong, T. D., Westfield	1878			Dunlap, Alex., Springfield	1873
Sturgis, F. R., New York	S			Dunlap, C. W., Springfield	1888
Sullivan, D. J., Brooklyn	1886			Dunn, O. B., Ironton	1883
Sullivan, J. F., New York	S			Dutton, C. F., Cleveland	1883
Sutton, H. G., Rome	1888			Ely, J. S., Barnesville	S
Swalm, W. F., Brooklyn	S			Evans, Firman R., Franklin	1885
Sweatman, N. F., Amsterdam	S			Evans, G. B., Dayton	1889
Swift, G. E., Hudson	S			Evans, O., Franklin	1888
Tanner, J. S., New York	S			Everhard, N. S., Wadsworth	1874
Taylor, D. M., Canajoharie	S			Everts, O., College Hill	1886
Taylor, J. R., New York	1878			Eyer, Alvin, Cleveland	S
Thomas, T. G., New York	1880			Fackler, G. A., Cincinnati	1886
Thompson, A. R., Troy	S			Falls, Wm. H., Cincinnati	1888
Thompson, E. H., New York	S			Fann, Geo. C., Kelley's Island	S
Thomson, J. C., Brooklyn	S			Ferguson, J. W., Canaan	1888
Thorne, J. K., Gloversville	S			Finley, Mary J., Mansfield	1888
Tieste, L. E., Brooklyn	S			Firestone, W. W., Wooster	1887
Timmerman, C. F., Amsterdam	S			Firmin, F. W., Findlay	1883
Toal, David D., New York	S			Fisher, H. H., Steubenville	1883
Todd, W. H., Dobbs Ferry	S			Focht, Wm. H., New Riegel	1887
Tompkins, F. J., Lansingburgh	S			Forbes, S. F., Toledo	1874
Totman, D. M., Syracuse	S			Fowler, S. W., Delaware	1883
Townsend, M. W., Bergen	1876			Franklin, G. S., Chillicothe	1883
Townsend, W. R., New York	1884			Fraunfelder, J., Canton	1883
Traver, R. D., Troy	S			French, J. M., Cincinnati	1883
Tremaine Wm. S., Buffalo	1878			Frew, Wm. C., Coshocton	1887
Tripp, C. H., Clinton Corners	1889			Gabriel, J. F., Piqua	1883
Truax, J. G., New York	1889			Galloway, G. W., Findlay	1891
Tucker, C. P., New York	S			Gawne, A. J., Sandusky	1883
Van Allen, S. L., Schenectady	S			Gay, N., Columbus	1884
Vanderveer, A., Albany	1879			Gehrette, T. M., Deshler	1891
Vanderveer, J. R., Brooklyn	1878			Gibson, R. D., Youngstown	1883
Van de Warker, E., Syracuse	1886			Gifford, W. R., Toledo	1884
Van Fleet, H. E., New York	S			Gilliam, D. Tod, Columbus	1889
Van Hovenberg, H., Kingstou	S			Goode, G. H., Cincinnati	1890
Van Wyck, R. C., Hopewell Junction	1889			Gordon, T. W., Georgetown	1875
Van Zandt, H. C., Schenectady	S			Gores, F. C., Cincinnati	1888
Veeder, A. T., Schenectady	S			Graefe, C., Sandusky	1884
Viroqua, P., Utica	S			Greenmyer, P. S., Orville	1890
Von Duering, S. A., New York	S			Haines, W. D., Cincinnati	1888
Wales, T. A., Elmira	1880			Hall, Rufus B., Cincinnati	1888
Walsh, T. C., Syracuse	S			Hall, W. W., Springfield	1888
Ward, R. H., Troy	1888			Hamilton, C. S., Columbus	1891
Ware, E. J., New York	S			Hamilton, H. A., Perrysburgh	1884
Washburn, U. LeRoy, New York	S			Hamilton, J. W., Columbus	1880
Watson, W. S., Matteawan	1891			Hamilton, W. D., Columbus	1890
Webster, S. H., Troy	S			Hamer, W. W., Bellefontaine	1890
Weisse, F. D., New York	1872			Hanse, A. F., Cleveland	1891
Wenz, J., Lancaster	1882			Ha dy, N., Massillon	1883
West, N. C., Rome	1864			Harmon, Julian, Warren	1874
Whedon, Jas. D., Syracuse	S			Harrison, E. B., Napoleon	1887
Wheeler, M. A., Troy	S			Hart, B. F., Marietta	1884
Whipple, G. E., Albany	S			Hart, H. A., Wooster	1888
White, W. M., Amsterdam	S			Hart, Samuel, Marietta	1888
White, Wm. T., New York	1866			Hathaway, H., Toledo	1883
Whitney, J. W., Syracuse	S			Hawn, Enos, Leetonia	1884
Wieber, Geo., Brooklyn	1889			Hedges, J. S., Mansfield	1891
Wiggin, F. H., New York	1890			Helferich, Emil, Cincinnati	1888
Wight, J. S., Brooklyn	1880			Hendly, F. W., Cincinnati	1877
Williams, F. T., Canton	S			Herrick, H. J., Cleveland	1888
Williams, W. H., Brooklyn	1860			Hiestand, E. B., Kenton	1886
Williamson, P. T., Poughkeepsie	S			Hill, N. S., Neville	1886
Wilson, W. H., New York	S			Himes, I. N., Cleveland	1876

NORTH CAROLINA.

Battle, S. W., Asheville	1891
Burtless, W. E., Hickory	1884
Gibson, Wm. J., Asheville	1888
Hadley, J. M., LaGrange	1891
Haigh, T. D., Fayetteville	1885
Haywood, H., Raleigh	1881
Herring, N. B., Wilson	1891
Jones, William J., Goldsborough	1889
King, E. S., Sweet Home	S
Lumsden, William J., Elizabeth City	1889
O'Hagan, C. J., Greenville	1872
Patterson, Duncan M., Mangum	1881
Pemberton, W. D., Monroe	1891
Perry, M. P., Macon	1891
Picott, L. J., Littleton	1891
Pitman, N. J., Tarboro	1849
Reagan, J. A., Weaverville	1885
Taylor, H. Longstreet, Asheville	1890
Tucker, John H., Henderson	1887
Williams, E. P., Cedar Creek	S
Wood, T. F., Wilmington	1891

OHIO.

Abel, S. V., Cleveland	1890
Albert, Dr., Cincinnati	S
Alford, Judson B., Grand Rapids	1888
Allen, Dudley, Cleveland	1888
Allen, George M., Cincinnati	1888
Allen, H. P., Columbus	1888
Alley, E. H., Toledo	1876
Ard, Frank C., Pomeroy	1889
Ayres, J. H., Urbana	1880
Ayres, S. C., Cincinnati	1888
Bain, F. D., Kenton	1884
Baker, A. R., Cleveland	1888
Barnes, W. T., Fredericksburg	1883
Barrett, J. E., Wooster	1883
Barton, T. J., Zanesville	1883
Battles, W. S., Shreve	1872
Beach, John W., West Jefferson	1883
Beardsley, C. E., Ottawa	1874
Beeman, P., Sidney	1883
Bell, A. E., Zanesville	1888
Bennett, John, Cleveland	1874
Bennett, J. H., Wauseon	1876
Bessey, J. M., Toledo	1888
Bishop, S. P., Delta	1885
Blair, B. H., Lebanon	1886
Blair, J. F., Linwood	1884
Boerstler, William N., Peninsula	S
Bossert, J., Washingtonville	1884
Boylan, Joseph E., Cincinnati	1888
Bramble, D., Cincinnati	1880
Brayton, Asa, Carey	1883
Bricker, W. R., Shelby	1883
Briggs, Eldorado, Wilmington	1888
Brigham, O. S., Toledo	1883
Brinkerhoff, David H., Fremont	1888
Brockett, A. J., Cleveland	1876
Brooke, G. W., Elsworth	1883
Brown, H. M., Hillsboro	1888
Brown, J. A., Germantown	1888
Bruehl, Gust., Cincinnati	1871
Brundage, A. H., Xenia	1883
Buckingham, G. M., Springfield	1884
Buckner, James H., Cincinnati	1864
Buechner, W. L., Youngstown	1882
Bugher, C. E., Caldwell	1890
Bunce, Wm., Oberlin	1878
Bundy, D. B., Jr., Middletown	1888
Bunn, J. W., West Union	1884
Burnhill, J. U., Columbus	1891
Byall, H. M., Kunkle	1889
Cain, A. R., Senacaville	1888
Caldwell, Charles E., Cincinnati	1888
Cameron, J. G., Edon	1888
Carmichael, W. A., Loveland	1880
Carpenter, Julia W., Cincinnati	1883
Cass, John, Hamilton	1883

Cassett, M., Cincinnati	1888
Chapman, B., Copley	S
Chapman, W. C., Toledo	1888
Cincinnati Hosp. Library, Cincinnati	S
Clark, J. H., Mechanicsburg	1888
Clark, M. S., Youngstown	1883
Cleveland, John L., Cincinnati	1889
Cline, J. B., Perins Mills	1888
Coleman, N. R., Columbus	
Collamare, G. A., Toledo	1883
Collins, Milton H., South Charleston	1888
Comegys, C. G., Cincinnati	1884
Conklin, S. A., Canton	1873
Conklin, W. J., Dayton	1878
Conner, P. S., Cincinnati	1867
Conrad, George R., New Vienna	1886
Cook, George F., Oxford	
Corson, J., Middletown	1883
Cosgrove, T. M., Auburndale	1881
Corson, O. M., Middletown	1878
Craig, G. W., Mansfield	1888
Craig, J. Harvey, Mansfield	1891
Crossland, J. C., Zanesville	
Culbertson, E., Havana	1878
Cushing, H. K., Cleveland	
Custer, L. E., Dayton	S
Cutler, Mary M., Pomeroy	1883
Dandridge, N. P., Cincinnati	1888
Davis, Wm. B., Cincinnati	1875
Dawson, W. W., Cincinnati	1888
De Vilbiss, A., Toledo	1888
Dickes, Philip, Greenville	1888
Dickey, T. A., Middletown	1888
Dimmick, O. A., Chardon	
Dimond, H. C., Springfield	1888
Dowling, F., Cincinnati	1891
Duncan, J. A., Toledo	1883
Dunham, Wm. H., Cincinnati	1888
Dunlap, Alex., Springfield	1873
Dunlap, C. W., Springfield	1888
Dunn, O. B., Ironton	1883
Dutton, C. F., Cleveland	1883
Ely, J. S., Barnesville	S
Evans, Firman R., Franklin	1885
Evans, G. B., Dayton	1889
Evans, O., Franklin	1888
Everhard, N. S., Wadsworth	1874
Everts, O., College Hill	1886
Eyer, Alvin, Cleveland	
Fackler, G. A., Cincinnati	1886
Falls, Wm. H., Cincinnati	1888
Fann, Geo. C., Kelley's Island	S
Ferguson, J. W., Canaan	1888
Finley, Mary J., Mansfield	1888
Firestone, W. W., Wooster	1887
Firmin, F. W., Findlay	
Fisher, H. H., Steubenville	1883
Focht, Wm. H., New Riegel	1887
Forbes, S. F., Toledo	1874
Fowler, S. W., Delaware	1883
Franklin, G. S., Chillicothe	1883
Fraunfelder, J., Canton	1883
French, J. M., Cincinnati	1883
Frew, Wm. C., Coshocton	1887
Gabriel, J. F., Piqua	1883
Galloway, G. W., Findlay	1891
Gawne, A. J., Sandusky	1883
Gay, N., Columbus	1884
Gehrette, T. M., Deshler	1891
Gibson, R. D., Youngstown	1883
Gifford, W. R., Toledo	1884
Gilliam, D. Tod, Columbus	1889
Goode, G. H., Cincinnati	1890
Gordon, T. W., Georgetown	1875
Gores, F. C., Cincinnati	1888
Graefe, C., Sandusky	1884
Greenmyer, P. S., Orville	1890
Haines, W. D., Cincinnati	1888
Hall, Rufus B., Cincinnati	1888
Hall, W. W., Springfield	1888
Hamilton, C. S., Columbus	1891
Hamilton, H. A., Perrysburgh	1884
Hamilton, J. W., Columbus	1880
Hamilton, W. D., Columbus	1890
Hamer, W. W., Bellefontaine	1890
Hause, A. F., Cleveland	
Heddy, N., Massillon	1891
Herrmon, Julian, Warren	1883
Harrison, E. B., Napoleon	1874
Hart, B. F., Marietta	1887
Hart, H. A., Wooster	1884
Hart, Samuel, Marietta	1888
Haythaway, H., Toledo	1883
Hewitt, Enos, Leetonia	1884
Hedges, J. S., Mansfield	1891
Hefrich, Emil, Cincinnati	
Hendly, F. W., Cincinnati	1888
Herrick, H. J., Cleveland	1877
Hestand, E. B., Kenton	1888
Hill, N. S., Neville	1886
Hines, I. N., Cleveland	1876

Hinckley, H. D., Oxford	1888	Mosgrove, S. M., Urbana	1880	Todd, J. H., Wooster	1883
Hiner, S. B., Lima	1873	Mount, J. L., Morrow	1882	Tressel, J. H., Alliance	1877
Hines, J. A., VanWert	1888	Mullen, Thos. J., New Richmond	1888	Trimble, R. T., New Vienna	1888
Hixson, M. M., Dupont	1891	Murphy, J. A., Cincinnati	1878	Trush, Jacob, Cincinnati	1888
Hobson, John A., Flushing	1888	Murray, L. S., Medina	1874	Tuller, Willis M., Bowling Green	1888
Hobson, J. F., Cleveland	1889	Mussey, W. L., Cincinnati	1890	Vail, J. B., Lima	1884
Hoeltge, A., Cincinnati	1883	Myers, J. A., Shelby		VanDupuy, T., Xenia	S
Hoff, J. W., Pomeroy	1883	Nash, E. K., Montrose	1890	VanPelt, C. L., Toledo	1888
Holmes, C. R., Cincinnati	S	North, John, Toledo	1877	VanWinkle, N. B., Blanchester	1888
Holston, J. G. F., Zanesville	1888	Norton, O. D., Cincinnati	1855	VonKlein, C. H., Cleveland	1883
Hoover, Charles E., Ross	1886	Noyes, H. J., McConnellsville	1876	Waggoner, Joseph, Ravenna	1882
Hoover, T. C., Columbus	1890	Oatley, A. C., Findlay		Walker, A. B., Canton	1891
Hough, C. A., Lebanon	1888	Osborn, Mary E., Cincinnati	1888	Walker, Edw. W., Cincinnati	1888
Howe, A. J., Cincinnati	S	Osborn, A. S., Norwalk		Walker, Geo. W., Roseville	1888
Hughes, W. K., Berlin Center		Parker, C. B., Cleveland	1887	Warner, E. J., Congress	1891
Hulick, J. W., Springfield	1888	Fatterson, A. V., Mansfield	1880	Watson, D., Bellefontaine	
Humiston, W. H., Cleveland	1883	Patten, F. H., Nat. Mil. Home	1884	Weaver, J. M., Dayton	1883
Hunt, A. H., Wooster	1883	Peachy, H. H., Loveland	S	Weaver, Wm. P., Miamisburg	
Hurd, A., Findlay	1874	Pomerene, P. P., Berlin	1878	Weeks, O. W., Marion	1883
Hyatt, E. H., Delaware	1890	Pearce, Henry C., Urbana	1888	Wenning, Wm. H., Cincinnati	1888
Hyndman, J. G., Cincinnati	1888	Pennell, W. W., Fredericktown	1888	Whittaker, J. T., Cincinnati	1881
Jacobs, W. C., Akron	1883	Peskind, Arnold, Cleveland		Wilbur, A. M., West Unity	1888
Jennings, D. R., Cleveland	1891	Pettitt, R. R., Dayton	1888	Wilkerson, Marion, Sabina	1888
Johnson, T. M., Canton	1891	Phillips, T. H., Canton	1883	Williams, P. M., Cheviot	1888
Johnson, O., Worthington	1883	Phythian, C. T., Cincinnati	1890	Williard, G. P., Tiffin	1891
Johnston, J. A., Cincinnati	1891	Pickard, F., Mt. Vernon	1883	Wilson, A. C., Youngstown	1891
Jones, Albert M., Eaton	1888	Pontius, L. W., Canton	1887	Wilson, DeWitt C., Ironton	1889
Jones, Frank S., Medina	1883	Pontius, Marion G., Canton	1888	Wilson, E. F., Columbus	
Jones, George E., Cincinnati	1888	Poore, R. J., Cincinnati	1888	Wiun, John J., Norwood	1888
Jones, J. D., Newburg	1888	Powell, H. H., Cleveland	1883	Winnes, Thomas D., Cincinnati	S
Jones, R. C., Cincinnati	1886	Powell, W. S., Defiance	1882	Wire, G. W., Wilmington	1888
Jones, R. E., Gomer	1882	Quinn, Allen T., Wilmington	1880	Withrow, John M., Cincinnati	1888
Jones, Toland, London	1883	Quirk, H. W., Cleveland	1889	Wood, John, Collinswood	1888
Jones, T. W., Columbus	1883	Race, W. H., Mansfield		Woodbridge, J. E., Youngstown	1869
Jones, W. W., Toledo	1856	Ransohoff, J., Cincinnati	1882	Woodruff, L., Alton	
Judkins, Wm., Cincinnati	1881	Ravogli, Aug., Cincinnati		Woods, J. T., Toledo	1884
Juler, Henry C., Cincinnati	1888	Read, A. N., Norwalk	1855	Woodward, W. R., Cincinnati	1888
Kahle, R. D., Lima	1888	Read, Charles A., Cincinnati	1888	Wright, S. J., Tallmadge	
Kelley, H. R., Galion	1884	Reamy, Thad. A., Cincinnati	1867	Wright, T. L., Bellefontaine	1888
Kelly, Webb J., Galion	1889	Redrow, J., Williamsburg	1883	Wylie, A. N., Ripley	1867
Kemper, A. C., Cincinnati	1888	Reed, C. R., Middleport	1883	Young, D. S., Cincinnati	
Kendig, E. V., Hayesville	1884	Reed, J. T., Massilon	1878	Zinke, E. G., Cincinnati	1884
Kennedy, Philip, Laurel	1889	Reed, R. H., Mansfield	1883		
Kinmont, T. C., Hicksville		Reed, W. F., Kalida	1883		
Kinnaman, A. S., West Salem	S	Reeve, J. C., Dayton	1866		
Kirkley, C. A., Toledo	1888	Reinfrank, J. H., Perrysburgh	1882		
Kirkpatrick, J. F., London	1891	Rhu, Auguste, Marion	1888		
Kirkpatrick, L., Berea		Rice, John B., Fremont			
Kirkpatrick, O. B., Cherry Fork	1888	Rice, R. H., Fremont	1882		
Kirt, G. P. I., East Liverpool		Ricketts, B. M., Cincinnati	1888		
Knight, Wm., Cincinnati	1888	Ricketts, E. A., Cincinnati	1884		
Koehler, Max, Cincinnati	1888	Ricketts, J. V., Cincinnati			
Kolb, M. B., Cleveland	S	Ridenour, A. W., Toledo	1877		
Kramer, S. P., Cincinnati	1891	Robison, J. D., Wooster	1859		
Krieger, G. S., Madisonville	1883	Rodgers, J. H., Springfield	1883		
Krouse, Louis J., Cincinnati	1888	Roebuck, D. Y., Dalton	1890		
Kurz, C. E., Bellaire	1883	Russell, John E., Mt. Vernon	1887		
Larimore, F. C., Mt. Vernon	1872	Ryan, Geo. W., Cincinnati	1888		
Lash, J. W., Chillicothe	1883	Sager, Joseph, Celina	1883		
Lathrop, J. M., Dover	1884	Sattler, Robt., Cincinnati	1888		
Lenhart, W. C., Zanesville	1883	Sawyer, J. P., Cleveland	1890		
Leonard, B. S., West Liberty	1884	Sawyer, P. H., Cleveland			
Leslie, J. M., Chillicothe	1888	Schwagmeyer, A., Cincinnati	1888		
Lightner, S. B., Sabina	1883	Schwartz, N. F., Shanesville			
Lincoln, J. C., Bowling Green		Scott, A. J., Loudonville	1881		
Long, John W., Bryan	1888	Scott, B. B., Mt. Vernon	1883		
Long, W. H., Cincinnati	1888	Scott, W. A., Swanton	S		
Loving, Starling, Columbus	1876	Scott, W. J., Cleveland	1876		
Luff, Theo. R., Cincinnati	1888	Scott, X. C., Cleveland	1874		
Lymau, C. N., Wadsworth	1874	Shaller, J. M., Cincinnati	1888		
McClellan, B. R., Mad River	1887	Sharp, H. J., London	1882		
McCollum, E. J., Tiffin	1885	Shaw, W. E., Cincinnati	1888		
McClung, J. C., Leipsic	1888	Sheldon, S. B., Five Mile	1883		
McCullough, J. G., Bellaire		Silver, D. R., Sidney	1883		
McCurdy, John, Youngstown	1883	Slager, J. L., Paulding	1890		
McCurdy, S. L., Dennison	1883	Slocum, C. E., Defiance	1875		
McDougal, John G., New Lexington	1888	Smith, D. B., Cleveland	1883		
McElbright, T., Akron	1867	Smith, Henry A., Cincinnati	1888		
McKee, E. S., Cincinnati	1885	Smith, Wm., Van Wert	1877		
McLaughlin, C. C., Dunkirk		Snodgrass, J., Kenton	1888		
McMillan, J. W., Columbus	1883	Snyder, D. J., Scio	1886		
McMurray, A. B., Marion		Spencer, E. R., Doylestown	1888		
McPherson, J. F., Cambridge	1888	Stamm, M., Fremont	1883		
Macready, James, Monroe	1888	Stanly, E., Sandusky	1883		
Marchland, J. F., Canton		Stanton, Byron, Cincinnati	1882		
Merriman, C. R., Akron		Starr, G. L., Hudson	1883		
Milliken, D., Hamilton	1882	Stevens, M. B., Defiance	1875		
Mills, J. T., Jersey	1890	Stewart, Robert W., Cincinnati	1888		
Miner, A. G., Niles	1885	Stewart, T. H., Church Hill	1876		
Mitchell, G. S., Cincinnati	1888	Strain, A. J., London	1886		
Mitchell, E. W., Cincinnati	1888	Sweeney, R. L., Marion	1883		
Mitchell, T. A., Owensville	1888	Sykes, D., Plymouth	1891		
Moody, M. M., Chatham Centre	1883	Taft, J., Cincinnati	1886		
Moore, C. S., Newark	S	Taylor, Joseph L., Wheelersburg	1888		
Moore, Wm., New Lisbon	1878	Taylor, Wm. H., Cincinnati	1873		
Morgan, C. L., Alliance		Thomas, F. W., Marion	1887		
Morris, J., Ironton	1878	Thompson, Wilbur R., Troy	1888		
Morrow, Edw. P., Canton		Thorne, S. S., Toledo	1883		
Mortland, J. C., Edgerton	1874	Thorner, M., Cincinnati	1888		
Moses, T. F., Urbana	1888	Thrasher, A. B., Cincinnati	1888		
Mosgrove, James M., Urbana	1887	Tobey, H. A., Dayton	S		

OREGON.

Boys, Wm., Portland	1882
Bridenstine, S. J., Weston	1883
Holmes, H. R., Portland	1880
Lund, M. I., Salem	S
Nicklin, A. J., Portland	
Owen, W. C., Coquille	S
Rockey, A. E., Portland	S
Wright, H. A., Salem	1889
Wurtz, Louis H., Gervais	1882

PENNSYLVANIA.

Agnew, D. H., Philadelphia	1872
Ainey, D. C., New Milford	1884
Albright, F. P., Lancaster	1891
Allen, E. P., Athens	1860
Allen, M. E., Philadelphia	S
Allport, H., Phillipsburg	1891
Allyn, G. W., Pittsburg	1891
Anders, J. M., Philadelphia	1884
Anderson, Joseph W., Ardmore	1889
Anderson, Wm., Indiana	1868
Asdale, W. J., Pittsburg	1860
Ash, H. St. Clair, Philadelphia	1890
Atkinson, W. B., Philadelphia	1859
Aulde, John, Philadelphia	1889
Ayres, S., Pittsburg	1884
Bacon, W. F., York	1891
Baer, B. F., Philadelphia	1885
Baker, Chas. S., Philadelphia	
Baldwin, L. K., Philadelphia	1884
Baldy, J. M., Philadelphia	1889
Ball, F. P., Lock Haven	1891
Balmer, A. F., Brookville	1883
Barker, T. R., Philadelphia	
Barkey, Peter, Erie	
Bartholow, Roberts, Philadelphia	1888
Bartleson, S. P., Clifton Heights	1883
Barton, J. M., Philadelphia	1878
Barr, G. W., Titusville	1868
Batten, J. M., Pittsburg	1876
Baxter, H. F., Philadelphia	1880
Beaver, D. B. D., Reading	1891
Beecher, A. C. W., Philadelphia	1889
Bell, G. Franklin, Williamsport	1890
Bennett, Alice, Norristown	1884
Berlin, J. O., Bath Postoffice	1881
Bernardy, E. P., Philadelphia	1891
Berntheisel, G. W., Columbia	1888
Birch, S. T. J., Port Carbon	1883
Bishop, W. T., Harrisburg	1884
Bittinger, J. H., Hanover	1881
Blachly, O. L., Sparta	1880
Blairsdell, I. C., Wilmore	1883

Bland, D. W., Pottsville		Forbes, W. S., Philadelphia	1884	Kirker, John, Allegheny	1883
Blumberg, A., Pittsburg	1884	Formad, Henry F., Philadelphia	1889	Kistler, O. F., Nesquehoning	1891
Boal, G. Y., Baden	1887	Forster, Wm., South Oil City	1884	Klingensmith, I. P., Blairsville	1878
Bradner, N. R., Philadelphia	1891	Forwood, W. H., Chester	1879	Klump, J. A., Williamsport	1891
Brandes, Charles, Erie		Foster, W. S., Pittsburg	1877	Koeller, F., Pittsburg	S
Breinig, P. B., Bethlehem	1865	Fox, L. Webster, Philadelphia	1887	Knapp, C. P., Wyoming	1889
Brendle, G. F., Mahoney City	1884	Frankhauser, F. W., Reading	1891	Knight, S. R., Philadelphia	1881
Brinton, J. H., Philadelphia	1880	Frazer, A. Blair, Kipple	1889	Knipe, J. O., Norristown	1880
Brobst, J. A., Macungie	S	Free, S. M., Beechtree	1884	Knox, W. F., McKeesport	1870
Brown, N. W., Pittsburg	1888	French, M. S., Philadelphia	1891	Krause, J. H., Plumsteadville	1889
Brumbaugh, A. B., Huntingdon	1884	Frichey, John A., Harrisburg	1888	Ladd, H., Philadelphia	1891
Brundage, A. T., Scranton	1880	Fricke, Albert, Philadelphia	1872	Landis, H., Reading	1891
Brush, E. N., Philadelphia	1884	Gable, I. C., York	1880	Lange, J. C., Pittsburg	1883
Buchanan, J. J., Allegheny	1887	Gaddis, L. S., Uniontown	1884	Langfitt, W. J., Allegheny City	1886
Bucher, I. R., Lebanon	1884	Gale, C. J., New Brighton		Laplace, E., Philadelphia	1891
Buckby, W., Philadelphia	1891	Gallagher, G. W., New Haven	S	Latham, P. H., Weatherly	1884
Burket, G. W., Tyrone		Gardner, H. D., Scranton	1891	Lautenbach, L. J., Philadelphia	1889
Burnett, C. H., Philadelphia	1891	Gates, L. M., Scranton	1889	Leadenham, J. W., Franklin	1882
Burnett, J., Scranton	1889	Gaus, E. S., Philadelphia		Leamen, B., Leamen Place	1872
Burns, R. B., Philadelphia	1889	Gemmell, J. M., Tyrone	1884	Leamen, H., Philadelphia	1872
Burrell, J. A., Williamsport	1890	Gerhard, George S., Ardmore P. O.	S	Lee, B., Philadelphia	1868
Buttermore, S., Connellsville	1874	Gerhard, J. Z., Sunbury	1878	Legge, J. H., Pittsburg	1890
Buzzard, John, Bangon	1888	Gibb, Jos. S., Philadelphia	1889	Levan, J. R., Philadelphia	1864
Cadwallader, C. E., Philadelphia	1887	Gibbs, L. H., Scranton	1881	Levick, J. J., Philadelphia	1864
Caldwell, Joseph R., New Hamburg	1887	Gibson, Maris, Wilkesbarre	S	Lineweaver, J. K., Columbia	1879
Cantrell, J. Abbott, Philadelphia	1889	Gillford, R. H., Allegheny	1883	Linn, G. A., Monongahela City	1874
Carpenter, John, Pottsville	1878	Given, S. A., Mercer, Clifton Heights	1889	Lippincott, J. A., Pittsburg	1880
Cawley, T. F., Upper Black Eddy		Goode, S. S., Meyersdale	1891	Livingston, J. B., West Middlesex	1874
Chase, R. H., Norristown	1891	Goodell, W., Philadelphia	1872	Livingston, T. M., Columbia	1876
Chestnut, J. H. W., Philadelphia	1889	Goodman, W. E., Philadelphia	1875	Lougshore, W. R., Hazleton	1884
Chritzman, H. G., Welsh Run	1884	Gotwald, D. K., York	1891	Longstreth, M. F., Sharon Hill	1876
Christy, F. C., Pittsburg	1891	Gould, G. M., Philadelphia	1891	Lowman, John, Johnstown	1883
Church, R. B., Williamsport	1884	Graham, S., Butler	1878	Lowrie, W. L., Tyrone	1884
Clagett, L. S., Blairsville	1881	Green, D. T., Easton		Luther, M., Reading	1891
Clark, A. T., Greenville		Green, J. J., Pittsburg	1883	Lytle, S. F., Philipsburg	1891
Clark, L. S., Philadelphia	1880	Green, W. D., Philadelphia	1890	McClellan, George, Philadelphia	1889
Clarke, Rowan, Tyrone	1880	Griswold, E., Sharon	1872	McClelland, C., Philadelphia	1882
Clarkson, J. A. C., Lewistown	1888	Grove, A. P. S., Dallastown	1891	McClurg, J. R., West Chester	1876
Cline, G. H., Jersey Shore	1891	Grove, J. H., Philadelphia	1867	McConnell, H. S., New Brighton	1882
Cline, J. C., Derry Station	1891	Guilford, W. M., Lebanon	1888	McFarlane, J. W., Pittsburg	1885
Cohen, J. Solis, Philadelphia	1876	Gump, S. H., Bedford	S	McGowan, W. D., California	1884
Cohen, S. Solis, Philadelphia	1889	Guth, M. S., Warren	1883	McIntire, Charles, Easton	
Cole, W. W., Allegheny	1886	Hakes, H., Wilkesbarre	1880	McKelvey, N. H., Pittsburg	1881
Collins, Charles, Philadelphia		Halberstadt, A., Pottsville	1891	McKeenan, T. M. T., Pittsburg	
Collins, James, Philadelphia	1868	Hall, F. L., New Richmond	1891	McNeil, G. W., Pittsburg	1882
Connell, J. G., Pittsburg	1882	Hall, Winfield S., Haverford College	1889	Mabon, T., Allegheny	1873
Connolly, J. P., Williamsport	1890	Hamaker, W. D., Meadville	1891	Mackres, H. O., Cory	1882
Coope, A. F., Oil City	1874	Hamilton, B. G., Emlenton	1883	Magoffin, M. M., Mercer	
Cooper, Alfred M., Point Pleasant	1889	Hamilton, W. C., Philadelphia	S	Marbough, F. L. W., Johnstown	1886
Cooper, Joshua M., Meadville	1888	Hammer, Robert B., Greensburg	1889	Marchand, J. I., Irwin Station	1883
Cooper, W. R., Point Pleasant	1891	Hare, H. A., Philadelphia	1889	Marsh, F. L., Mt. Pleasant	1881
Coover, E. H., Harrisburg	1877	Harnan, G. G., Huntingdon	1890	Martin, Edward, Philadelphia	1890
Cordier, A. H., Philadelphia	1888	Harrison, A. C., Meyersdale	1891	Massey, G. Betton, Philadelphia	
Corson, E. M., Norristown	1891	Haworth, E. B., Pittsburg	1890	Massey, Isaac, West Chester	1883
Corson, Hiram, Plymouth Meeting	1847	Hay, J. A., York		Mayberry, C. B., Danville	
Craig, Alex., Columbia	1870	Hay, Thomas, Philadelphia	1866	Mears, J. Ewing, Philadelphia	1870
Crawford, J. B., Wilkesbarre	1872	Hayes, I. Minis, Philadelphia	1881	Med. Dep't House Cor., Holmesburg	S
Crawford, John K., Cooperstown	1876	Hearne, W. J., Philadelphia	1884	Meredith, H. B., Danville	
Crawford, R., Cooperstown	1878	Heilman, Russell P., Emporium	1886	Miller, A. M., Bird-in-Hand	1880
Crosthwaite, D. W., Altoona	1891	Heilman, Samuel P., Heilman Dale	1889	Miller, D. P., Huntingdon	1872
Cunningham, J. G., Kittanning	1883	Hengst, D. A., Pittsburg	1883	Miller, Joseph S., York	1887
Curtin, R. G., Philadelphia	1880	He kle, A. G. B., Philadelphia		Miller, O. L., Allegheny	1877
Curwen, John, Warren	1870	Henry, F. P., Philadelphia	1880	Minich, A. K., Philadelphia	1884
DaCosta, J. C., Philadelphia	181	Hermany, P., Mahoney City	1883	Montelius, R. W., Mt. Carmel	1890
Daly, W. H., Pittsburg	1887	Herr, A. J., Lancaster	1881	Montgomery, E. E., Philadelphia	1889
Davis, E. P., Philadelphia	1891	Herr, M. L., Lancaster	1880	Montgomery, John, Chambersburg	1880
Davis, F. F., South Oil City	1883	Hertzog, W. F., Oley	1885	Moore, J. Harvey, Pittston	
Davis, Reese, Wilkesbarre	1890	Heustis, J. W., Pittsburg	1890	Morris, J. C., Philadelphia	1881
Davis, Thomas D., Pittsburg	1888	Hirst, Barton C., Philadelphia	1889	Morrison, W. H., Holmesburg	
Davison, J. E., Unity Station	1887	Hitzrot, H. W., McKeesport	1887	Morton, T. G., Philadelphia	1876
Davison, F. B., Fleetville	1885	Hoch, W. R., Philadelphia	1891	Morton, Thomas S. K., Philadelphia	1889
Deaver, John Blair, Philadelphia	1889	Hoffmann, J. H., Pittsburgh	1884	Mossman, B. E., Greenville	1874
Deaver, J. M., Buck	1884	Hoffman, Jos., Philadelphia	1889	Motter, M. G., Lancaster	
DeLong, W. D., Pikesville	S	Holcomb, G. C., Ulster	S	Mowery, Henry A., Marietta	1888
Deschweinitz, G. E., Philadelphia	1890	Holland, J. W., Philadelphia	1887	Mowry, R. B., Allegheny	1850
Detwiler, B. H., Williamsport	1886	Holley, S. L., Nanticoke	1885	Murdock, J. B., Pittsburg	1875
Devor, J. H., Fort London	1890	Holman, J., Allegheny	1891	Murphy, Joseph A., Wilkesbarre	1878
Dille, J. W., Cooperstown	1883	Holmes, E. H., Philadelphia	1889	Musser, F. Charles, Aaronsburg	1887
Diller, T., Pittsburg	1891	Hopkins, W. B., Philadelphia	1889	Musser, J. H., Lampeter	1880
Donaldson, J. B., Canonsburg	1884	Horner, C. W., Philadelphia	1890	Musser, John H., Philadelphia	1889
Drake, H. H., Norristown	1890	Hosack, J. P., Mercer	1876	News, C. T. A., Philadelphia	
Drysdale, Thomas M., Philadelphia	1873	Howell, J., Wilkesbarre		Neyman, A. N., Butler	1883
Duhring, L. A., Philadelphia	1884	Hughes, D., Philadelphia	1891	Nichols, James, Bradford	1888
Dulles, C. W., Philadelphia	1884	Hughes, J. W., Latrobe	1874	Nutt, G. D., Williamsport	1884
Dundor, A. B., Reading	1873	Hughes, M. B., Shickshinny	1888	O'Brien, Wm. D., Pittsburg	1890
Dunglison, R. J., Philadelphia	1874	Hull, A. P., Montgomery Station	1891	O'Hara, M., Philadelphia	1878
Dunmire, George B., Philadelphia	1884	Hulshizer, A. H., Philadelphia	1889	Oliver, Charles A., Philadelphia	1890
Earlev, Charles R., Ridgway	1887	Huselson, W. S., Allegheny	1872	O'Malley, A. P., Wilkesbarre	
Edsall, F. H., Pittsburg	1891	Jackson, E., Philadelphia	1884	O'Neal, J. W. C., Gettysburg	1875
Eisenberg, P. Y., Norristown	1891	Jauney, W. S., Philadelphia	1880	Orth, H. L., Harrisburg	1877
Ellenberger, J. W., Harrisburg	1884	Johnson, W. H., Robertsdale	1888	Ourt, Andrew J., Philadelphia	
Elliott, Thomas, Worth	S	Jones, M. O., Pittsburg	1887	Packard, J. H., Philadelphia	1878
Enfield, A., Bedford		Kaue, Evon O., Kane	1888	Painter, Wm. P., Darby	1889
Erdman, M. S., Richlandtown	1891	Kay, Thomas W., Scranton	1883	Pancoast, W. H., Philadelphia	1876
Erdman, W. B., Macungie	1880	Kearns, W. D., Pittsburg	1885	Park, J. W., Harrisburg	1884
Ewing, R. B., West Grove	1881	Keen, W. W., Philadelphia	1891	Parke, T. E., Downingtown	1890
Fry, John, Altoona	1858	Kerlin, I. N., Elwin	1885	Parish, Wm. H., Philadelphia	1889
Fenton, T. H., Philadelphia	1884	Keyser, P. D., Philadelphia	1870	Parvin, T., Philadelphia	1867
Findley, W. M., Altoona	1869	Kibler, C. B., Cory	1876	Peltz, J., Philadelphia	1885
Fischer, Emil, Philadelphia	1868	Kemble, Z. E., Liberty	1891	Penrose, Charles B., Philadelphia	1888
Flick, Laurence F., Philadelphia	1889	King, Cyrus B., Allegheny	1884	Pepper, Wm., Philadelphia	1872

Perkins, F. M., Philadelphia.	1887
Phillips, E., New Haven.	1876
Phillips, J. S., Allegheny.	S
Pillow, R. H., Butler.	1884
Pollock, A. M., Jr., Pittsburg.	1850
Price, Joseph, Philadelphia.	1888
Price, M., Philadelphia.	1891
Pursell, H., Bristol.	1889
Rahausen, G. G., Pittsburg.	1878
Rahter, C. A., Harrisburg.	1884
Ramsey, R. W., Chambersburg.	1880
Randall, B. A., Philadelphia.	1890
Rankin, D. N., Allegheny.	1878
Rea, J. L., Scranton.	
Reading Room Woman's Med. College of Pennsylvania, Philadelphia.	S
Reagan, G. L., Berwick.	1876
Reber, W. M., Bloomsburg.	1884
Reeser, H. S., Reading.	1884
Richards, J. N., Fallsington.	1889
Richardson, Wm. L., Montrose.	1863
Rickards, W. M. L., Philadelphia.	1874
Rigg, J. E., Wilkesburg.	1883
Riggs, E. S., Allegheny.	1876
Risley, S. D., Philadelphia.	1891
Ritchey, J. A., Oil City.	1876
Roberts, J. B., Philadelphia.	1881
Robinson, J. Q., West Newton.	1888
Rockwell, LeRue D., Union City.	1888
Roebuck, P. J., Lititz.	1891
Roedel, H. H., Lebanon.	S
Rogers, A. J., Scottsdale.	
Ross, J. D., Williamsburg.	1854
Ross, J. Frank, Clarion.	1889
Ross, S. M., Altoona.	1882
Ruschenberger, W. S. W., Philadelphia.	1850
Russ, E. J., St. Marys.	1884
Rutledge, S. R., Blairsville.	1876
Sapp, F. W., Dagus Mines.	1890
Schneider, L., Williamsport.	
Scott, Frank, Monongahela City.	1889
Seem, A. A., Bangor.	1884
Seibert, Wm. H., Steelton.	1888
Seiler, Carl, Philadelphia.	1880
Seiple, John, Wilkinsburg.	1880
Shakespeare, E. O., Philadelphia.	
Shaw, T. W., Pittsburg.	1881
Shearer, J. Y., Sinking Spring.	1880
Shillito, G. M., Allegheny.	1879
Shimwell, B. T., Philadelphia.	1890
Shober, J. B., Philadelphia.	1890
Shoemaker, G. E., Philadelphia.	1890
Shoemaker, J. V., Philadelphia.	1878
Shoemaker, W. A., Dawson.	
Shugert, F. H., Tidioute.	1884
Silliman, J. E., Erie.	1884
Simpson, T. P., Beaver Falls.	1884
Simpson, W. C., New Brighton.	1884
Slocum, H. A., Philadelphia.	S
Small, J. F., York.	1891
Snively, I. N., Waynesboro.	1876
Snively, W., Pittsburg.	1880
Spencer, C. A., Dallas.	
Stahley, G. D., Gettysburg.	1880
Steinbach, L. W., Philadelphia.	1889
Stellwagen, T. C., Philadelphia.	
Stemmetz, E. G., Hokendauqua.	1878
Sterrett, J. P., Pittsburg.	1876
Stevens, C. L., Athens.	1890
Stevenson, J. M., Pittsburg.	1882
Stewart, Wm. S., Philadelphia.	1876
Stiles, G. M., Conshohocken.	1876
Stille, Alfred, Philadelphia.	1847
Stout, A., Bethlehem.	1841
Straight, A. M., Bradford.	1883
Strawbridge, G., Philadelphia.	1876
Strickler, A. H., Waynesboro.	1884
Strickler, A. W., Scottsdale.	1884
Sturgeon, W. H., Uniontown.	1891
Taylor, L. H., Wilkesbarre.	1886
Thayer, A., Erie.	1878
Thayer, H. W., Corry.	1891
Thomas, C. H., Philadelphia.	1891
Thomas, J. D., Pittsburg.	1880
Tidd, E. J., Clark.	
Trabert, J. W., Annville.	1884
Tra y, E. G., Troy.	1889
Treichler, C. G., Honey Brook.	1880
Tweedle, J. B., Weatherly.	1883
Trowbridge, G. R., Danville.	1891
Turnbull, L., Philadelphia.	1852
Twitmyer, J. H., Sharpsville.	1884
Tyson, James, Philadelphia.	1876
Ulrich, W. B., Chester.	1875
Unger, D. F., Mercersburg.	1880
VanKirk, T. R., McKeesport.	
VanLennep, W. B., Philadelphia.	S
Varian, Wm., Titusville.	1876
Vastine, G. H., Catawissa.	1876
Vincent, C. Jane, Allegheny.	S
Vincent, J. R., Pittsburg.	1890

Wagoner, G. W., Johnstown.	
Waid, J. T., Ridgway.	1885
Walker, J. B., Philadelphia.	1884
Walker, R. L., Mansfield Valley.	1888
Walker, H. B., Harrisburg.	1884
Ward, S. M., Scranton.	
Waugh, W. F., Philadelphia.	1889
Weaver, J. R., Norristown.	1878
Weaver, W. G., Wilkesbarre.	1880
Weber, C. Z., Norristown.	1889
Weidman, W. M., Reading.	1876
Welch, W. M., Philadelphia.	1872
Welchhaus, G. R., Lancaster.	1884
Werder, N. O., Pittsburg.	1890
Werner, Marie B., Philadelphia.	1890
Whann, W. L., Franklin.	1883
White, Francis E., Philadelphia.	1889
White, Thos. L., McKeesport.	1887
Willard, DeForest, Philadelphia.	1880
Williams, W. L., Ridgway.	1883
Williams, Roger, Pittsburgh.	1882
Williams, W. T., Mt. Carmel.	1890
Wilson, C. G., St. Mary's.	1884
Wilson, S. F., Jarrettown.	1885
Wilson, J. C., Philadelphia.	1884
Wilson, J. H., Beaver.	1882
Wireback, I. J., St. Petersburg.	1883
Witmer, I. M., Conestoga.	
Wolfe, Samuel, Philadelphia.	1890
Wolff, L., Philadelphia.	1887
Wood, C. B., Monongahela City.	1882
Wood, E. A., Pittsburg.	1870
Woodbury, F., Philadelphia.	1877
Worrell, J. W., Brownsville.	1883
Yoss, G. P., Glen Rock.	
Young, T. J., Titusville.	1874
Ziegler, G. J., Philadelphia.	1853
Ziegler, I. L., Mount Joy.	1891
Zuiller, J. M., Allegheny.	S

RHODE ISLAND.

Arnold, Asst. Surg., U. S. N., Newport.	1863
Baldwin, M. E., Newport.	1889
Barker, C. F., Newport.	1889
Briggs, Alex. B., Ashaway.	1889
Burge, Wm. J., Pawtucket.	1880
Carr, Geo. W., Providence.	
Collins, Geo. L., Providence.	1889
Curley, P. F., Newport.	1889
Farrell, J. T., Providence.	1890
Fifield, M., Centerville.	1880
Fisher, C. H., Providence.	1858
Fuller, Frank B., Pawtucket.	1889
Gardner, H. K., Wakefield.	1889
Gardner, C. T., Providence.	1880
Garvin, L. F. C., Lonsdale.	1889
Green, Benjamin, Portsmouth.	
Hunt, S., E. Providence.	1885
Hutchinson, W. F., Providence.	1889
Keene, Geo. F., Howard.	1889
Kenyon, G. H., Providence.	1884
Kingman, Eugene, Providence.	1889
McCraw, Wm. J., Providence.	1889
Mitchell, J. W., Providence.	1889
Palmer, W. H., Providence.	1889
Peckham, Jr., F. H., Providence.	1889
Remick, A., Providence.	1881
Saunders, A. A., Carolina.	191
Sherman, W. S., Newport.	1889
Stanley, Geo. H., Pawtucket.	1889
Storer, H. R., Newport.	1878
Traver, W. H., Providence.	1880
Turner, H. E., Newport.	1889
Webb, J. A., Providence.	1889
Whitney, Jas. O., Pawtucket.	1889
Wise, Surgeon J. C., Newport.	

SOUTH CAROLINA.

Baily, T. B., Georgetown.	1884
Brodie, R. L., Charleston.	S
Brownsley, C. H., New Road.	
Croft, T. J., Aiken.	1870
De Saussure, P. G., Charleston.	1890
Doyle, O. M., Seneca.	
Evans, James, Florence.	1881
Geddings, W. H., Aiken.	1877
Huger, W. H., Charleston.	1884
Kinlock, R. A., Charleston.	1853
Kollock, G. W., Charleston.	1885
Legare, T., Charleston.	
McCoy, Thos., Laurens.	1890
McIntosh, J., Newberry.	1891
McKie, T. J., Woodlawn.	1883
Moore, A. A., Camden.	1890
Orr, Sam'l M., Anderson.	1889
Porcher, W. P., Charleston.	S
Rhett, R. B., Charleston.	1890

Simons, Manning, Charleston.	1870
Talley, A. N., Columbia.	1858
Winstock, J. H., Charleston.	1891
Woodruff, J. C., Edisto Island.	S

TENNESSEE.

Abernathy, C. A., Pulaski.	1890
Abernathy, C. C., Pulaski.	1890
Allen, Jesse W., Port Royal.	1890
Arrington, J. I., Nashville.	1890
Atchison, T. A., Nashville.	1890
Atchison, W. A., Nashville.	1890
Bandy, R. W., Gleason Station.	1890
Banks, D. F., Jordonia.	1890
Barkley, D. C. V., Chattanooga.	1890
Baxter, Geo. A., Chattanooga.	1890
Beaumont, C. W., Clarksville.	1890
Black, J. H., Memphis.	1885
Blanks, J. H., Nashville.	1890
Bonner, M. H., Nashville.	1890
Boyd, John M., Knoxville.	1857
Bradley, M. L., Sadlersville.	1890
Bridges, Jas. N., Readyville.	1890
Briggs, Chas. S., Nashville.	1890
Briggs, W. T., Nashville.	1869
Brown, A. B., Waverly.	1890
Buist, John R., Nashville.	1800
Byrn, J. F., Murfreesboro.	1885
Cain, John S., Nashville.	1890
Callender, Jno. H., Nashville.	1887
Campbell, M., Knoxville.	1889
Campbell, W. W., Austin.	1890
Carmichael, J. W., Knoxville.	1890
Carriger, Sterling J., Knoxville.	1888
Carter, Robt. H., Lynnville.	1890
Cawood, Jefferson C., Knoxville.	1888
Cheatlain, Richard, Nashville.	1887
Cliffe, D. B., Franklin.	1890
Cole, J. D., Newbern.	1890
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Coop, W. A. H., Dyersburgh.	1883
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Crawford, J. Y., Nashville.	1886
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 Beebe & Beebe, West Superior S
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 Bell, S., Beloit 1880
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 Buck, E. J., Platteville 1888
 Caldwell, Margaret, Waukesha 1888
 Catlin, Geo. E., Lake Geneva 1880
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 Christensen, C., LaCrosse S
 Clarke, A., Sheboygan 1882
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 Day, Henry L., Eau Claire 1887
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 Dempsey, P. W., Milwaukee S
 Dodge, N., Milwaukee S
 Dodson, N. M., Berlin 1872
 Dorland, James, Milwaukee 1877
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Dudley, E. H., Janesville 1882
 Dunge, J. H., Milwaukee S
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 Earll, R. W., Columbus 1884
 Eastman, W., Mineral Point 1882
 Edwards, J. B., Manston 1887
 Eldridge, E. F., New London 1885
 Emmons, J. W., Sparta 1887
 Evans, E., LaCrosse S
 Evans, F. W., Madison S
 Everhard, F. A., Ripon 1890
 Favill, H. B., Madison S
 Fisk, M. H., Wauwatosa 1882
 Fox, P., Madison 1877
 Fox, Wm., Milwaukee 1876
 Francis, S. M., Madison S
 French, C., Ashland S
 French, S. W., Milwaukee 1883
 Gage, M. R., Sparta 1881
 Garlock, F. R., Racine 1884
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 Graettinger, A., Milwaukee 1876
 Gregory, L. M., Stevens Point 1888
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 Harris, B. F., West Superior S
 Harris, P. H., Milwaukee S
 Hausmann, Wm., Elmore 1878
 Hawley, Robt. N., Milwaukee 1887
 Hayes, D. J., Milwaukee S
 Hayman, E. H., Boscobel 1887
 Hayward, John C., Marshfield 1887
 Hidershide, G. N., Arcadia 1881
 Hobday, W. A., Hurley 1883
 Huennekens, J. H., Milwaukee S
 Irwin, Edmond H., Lodi 1884
 Jenkins, Geo. W., Kilbourn City 1878
 Johnson, Sam C., Hudson 1882
 Johnson, S. D., Milwaukee S
 Kalmerton, E. E., Milwaukee S
 Kaunheimer, G., Milwaukee 1891
 Kellogg, E. W., Milwaukee S
 Kirk, W. H., Milwaukee S
 Kitto, R. A., Racine S
 Knox, C. S., West Superior S
 La Count, D., Wausau 1873
 Langland, P., Milwaukee S
 Leffingwill, H. S., Milwaukee S
 Lewis, C. H., Milwaukee S
 Lindenschmidt, F. J., Milwaukee S
 Linjir, O. E., West Superior S
 Lyman, J. V. R., Eau Claire 1889
 McArthur, Daniel S., La Crosse 1887
 McDonald, E. M., Beaver Dam 1887
 McGill, P. G., West Superior S
 McGuffin, Jas., Milwaukee S
 Mackie, W., Milwaukee 1888
 Malone, W. F., Milwaukee S
 Marks, S., Milwaukee 1877
 Maurer, A. A., La Crosse S
 Meacham, J. G., Racine 1886
 Mereness, D., Milwaukee S
 Merville, H. P., Milwaukee S
 Miller, C. I., Whitewater S
 Miller, D. McL., Oconomowoc 1887
 Mishoff, J. D., Milwaukee S
 Moore, D. W., Waupun 1887
 Morrow, H., Mendota S
 Mueller, F., Milwaukee S
 Mueller, H. F., West Superior S
 Munro, S. R., Milwaukee S
 Neilson, W. H., Milwaukee S
 Nissen, H. K., La Crosse S
 Nolte, L. G., Milwaukee S
 Nye, Fred T., Beloit 1887
 O'Brien, D. F., La Crosse S
 O'Brien, J. N., Milwaukee 1877

Orlady, H., Durand S
 Otilie, C., La Crosse 1884
 Otto, J. H., Milwaukee S
 Palmer, H., Janesville 1876
 Patterson, F. W., Milwaukee S
 Philler, H., Waukesha 1887
 Phillips, J., Stevens Point 1884
 Poppe, H. R. R., Scandinavia S
 Reed, W. A., Necedah S
 Reeve, Jno., West Superior S
 Reeve, J. T., Appleton 1877
 Regner, J. A., West Superior S
 Reinhard, C., Milwaukee S
 Reinhard L., Milwaukee S
 René, J. A., West Superior S
 Reynolds, B. O., Lake Geneva 1888
 Rhode, Henry, Green Bay 1890
 Riddell, S. S., Chippewa Falls 1884
 Rinehart, W. T., Ashland 1891
 Rockwell, W. M., Johnstown Centre S
 Rood, G., Stevens Point 1888
 Russell, H. A., West Superior S
 Russell, J. C., West Superior S
 Russell, T. P., Oshkosh 1873
 Sauerhering, D., Wausau 1889
 Sauerhering, A., Mayville 1887
 Saxton, W. D., Milwaukee S
 Scheig, E., West Superior S
 Schiller, L., Milwaukee S
 Schmitt, P., Milwaukee S
 Schmitz, E. A., Milwaukee S
 Scollard, W. E., Milwaukee S
 Seiler, Geo., Alma 1888
 Sercomb, H. F., Milwaukee S
 Sheldon, C. S., Madison S
 Shimonek, F., Milwaukee S
 Spearman, A. S., Milwaukee S
 Spork, F., West Superior S
 Stair, N. P., Fort Atkinson S
 Stansbury, E., Appleton 1882
 Steele, Geo. M., Oshkosh 1877
 Tallman, W., La Crosse S
 Tallman, W. L., Mineral Point 1884
 Tanner, H. B., S. Kaukauna 1888
 Thrane, A. D., Eau Claire 1880
 Townsend, E. H., New Lisbon 1887
 Traverse, A. W., Milwaukee S
 Trowbridge, J. B., Hayward S
 Vincent, G. R., Tomah 1887
 Vivian & Son, Mineral Point S
 Wahl, E., Milwaukee S
 Walbridge, J. S., Berlin 1883
 Wall, H. D., Richland Centre 1882
 Walsh, T. G., Milwaukee S
 Ward, A. G., Madison 1876
 Ward, C. H., Milwaukee S
 Wegge, W., Winnebago S
 Whetzel, F. F., Milwaukee S
 Whiting, J. B., Janesville 1891
 Whyte, W. F., Watertown 1891
 Wick, W. J., Milwaukee S
 Wiggington, R. M., Waukesha 1882
 Wiley, Frank S., Fon du Lac 1887
 Williams, T., Milwaukee S
 Williamson, J. D., Milwaukee S
 Wilson, W. H., Lake Geneva S
 Wiltrout, J. D., Hudson S
 Wingate, U. O. B., Milwaukee 1886
 Wisconsin State Hospital for Insane,
 Mendota S
 Witter, G. F., Grand Rapids 1887
 Würdeman, H. V., Milwaukee
 Young, Arthur, Prescott 1887
 Zartzen, B., Milwaukee S
 Zaun, H. H., Milwaukee S
 Zeit, F. R., Medford 1890

WYOMING.

Stuver, E., Rawlins. 1890

EXCHANGES.

Albany Med. Annals Albany, N. Y.
 American Jour. of the Medical Sciences, Philadelphia, Pa.
 Am. Jour. Obstet. New York, N. Y.
 Am. Jour. of Ophthalmology . St. Louis, Mo.
 Am. Jour. of Pharmacy . Philadelphia, Pa.
 American Med. Jour. St. Louis, Mo.
 Am. Practitioner and News . Louisville, Ky.
 Analectic, R. W. Amidon . New York, N. Y.
 Annals of Surgery Brooklyn, N. Y.
 Au'l Univ. Med. Sciences . Philadelphia, Pa.
 Archives of Gynecology New York, N. Y.
 Archives Ophthalmology . New York, N. Y.
 Army Med. Library and Museum, Washington, D. C.
 Atlanta Med. and Surg. Jour. . Atlanta, Ga.
 Boston Med. and Surg. Jour. . Boston, Mass.
 Canada Lancet Toronto, Can.
 Canadian Practitioner Toronto, Can.
 Chicago Med. Recorder Chicago, Ill.
 Cincinnati Med. News Cincinnati, O.
 Cleveland Med. Gazette Cleveland, O.
 College and Clinical Record, Philadelphia, Pa.
 Columbus Med. Jour. Columbus, O.
 Daniel's Med. Jour. Austin, Tex.
 Davis, F. A. Philadelphia, Pa.
 Dental Cosmos Philadelphia, Pa.
 Dental Register Youngstown, O.
 Dental Review Chicago, Ill.
 Dietetic Gazette New York, N. Y.
 Druggists' Circ. Newspaper, New York, N. Y.
 Edwards, Jos. F. Philadelphia, Pa.
 Gibson, L. P. Little Rock, Ark.
 Gunn, R. A. New York, N. Y.
 Hahnemannian Monthly . Philadelphia, Pa.
 Herald and Presbyter Cincinnati, O.
 Hersey, G. D. Providence, R. I.
 Independent Practitioner, Philadelphia, Pa.
 Indiana Med. Jour. Indianapolis, Ind.
 Jour. of Balneology New York, N. Y.
 Jour. of Cut. and Ven. Diseases, New York, N. Y.
 Jour. of Gynecology Toledo, O.
 Jour. of Inebriety Hartford, Conn.
 Jour. Men Nerv. Dis. New York, N. Y.
 Kansas City Med. Rec. Kansas City, Mo.
 La Gazette Med. de Montreal . Montreal, Can.
 Lancet Detroit, Mich.
 Lancet and Clinic Cincinnati, O.
 Library Rush Med. Col. Chicago, Ill.
 L'Union Medicale du Canada . Montreal, Can.
 Maryland Med. Jour. Baltimore, Md.
 Massachusetts Med. Jour. . Boston, Mass.
 Med. and Surg. Jour. Buffalo, N. Y.
 Medical Abstract New York, N. Y.
 Medical Advance Chicago, Ill.
 Medical Age Detroit, Mich.
 Medical Brief St. Louis, Mo.
 Medical Bulletin Philadelphia, Pa.
 Medical Herald St. Joseph, Mo.
 Medical Index Kansas City, Mo.
 Medical Mirror St. Louis, Mo.
 Medical News Philadelphia, Pa.
 Medical Record New York, N. Y.
 Medical Register Philadelphia, Pa.

Medical Review Pittsburg, Pa.
 Medical Standard Chicago, Ill.
 Medical Summary Philadelphia, Pa.
 Medical Times New York, N. Y.
 Medical World Philadelphia, Pa.
 Medicinische Monatsschrift . New York, N. Y.
 Memphis Med. Monthly Memphis, Tenn.
 Michigan State Board of Health, Lansing, Mich.
 National Druggist St. Louis, Mo.
 New England Med. Monthly, Danbury, Conn.
 New Orleans Med. Journal, New Orleans, La.
 New York Med. Jour. New York, N. Y.
 Newberry Library Chicago, Ill.
 North Am. Jour. of Homoeopathy, New York, N. Y.
 North Am. Practitioner Chicago, Ill.
 N. C. Med. Jour. Wilmington, N. C.
 Northwestern Lancet St. Paul, Minn.
 Northwestern Med. Journal, Minneapolis, Minn.
 Occidental Med. Times Sacramento, Cal.
 Pacific Med. and Surg. Jour., San Francisco, Cal.
 Pacific Medical Record . San Francisco, Cal.
 Paul Paquin, Bacteriological World, Columbia, Mo.
 Peoria Med. Monthly Peoria, Ill.
 Pharmaceutical Era Detroit, Mich.
 Philadelphia Med. Times . Philadelphia, Pa.
 Physician and Surgeon Ann Arbor, Mich.
 Public Library Cincinnati, O.
 Sanitary News Chicago, Ill.
 Sou. Cal. Practitioner Los Angeles, Cal.
 Southern Dental Jour. Atlanta, Ga.
 Southern Med. Rec. Atlanta, Ga.
 Southern Practitioner Nashville, Tenn.
 State Board of Health Bulletin, Nashville, Tenn.
 Texas Health Jour. Dallas, Tex.
 The Dixie Doctor Atlanta, Ga.
 The Druggist St. Louis, Mo.
 The Microscope Trenton, N. J.
 The Pulse Quarterly Cincinnati, O.
 Therapeutic Gazette Philadelphia, Pa.
 Toledo Med. and Surg. Reporter, Toledo, O.
 Univ. Med. Magazine Philadelphia, Pa.
 Va. Medical Monthly Richmond, Va.
 Weekly Med. Review St. Louis, Mo.
 Western Medical Reporter . . Chicago, Ill.

FOREIGN.

Archives De Biol. Slaves Paris, France.
 Archives de Tocologie Paris, France.
 Australasian Med. Gaz New South Wales.
 Augagneur, Victor Lyons, France.
 Bibliotheque Medicale Paris, France.
 Boletins de Medicinae Santiago, Chili.
 Brazil Medica Rio de Janeiro, Brazil.
 Ex de Bresseur Liege, France.
 British Medical Journal London, Eng.
 Bulletin Medical Paris, France.
 Bureaux de la Revue des Sciences Medicales . Paris, France.
 Centralblatt fr. Chirurgie Leipzig, Ger.

Centralblatt f. Gynäkologie . . Leipzig, Ger.
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 Cindad Bolivar Medica Ciudad Bolivar . . Venezuela
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 Dor, Prof. Dr. H. Lyons, France.
 Dublin Jour. Med. Sciences Dublin, Ireland.
 Edinburgh Med. Jour. Edinburgh, Scotland.
 El Oscolar Medico, Monterey, Mexico, S. A.
 El Monitor Medi. a Lima, Peru.
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 Gazeta Medica de Bahia Bahia, Brazil.
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 Gazette Medicale de l'Algerie, Paris, France.
 Gazette Medicale de Paris Paris, France.
 Glasgow Med. Jour. Glasgow, Scotland.
 Guttman, S., Wochenschrift Berlin, Ger.
 Indian Medical Gazette Calcutta, India.
 Internationale Klinische Rundschau . Vienna, Austria.
 Journal D'Hygiene Paris, France.
 Journal de Medecine de Paris, Paris, France.
 La Cronica Medica Lima, Peru.
 La Medicina Cientifica, Ciudad-Mexico, Mexico.
 La Semaine Medicale Paris, France.
 Les Nouveaux Remedes Paris, France.
 Le Progres Medical Paris, France.
 London Medical Record London, Eng.
 L'Union Medicale Paris, France.
 Naturwissenschaftliche Gesellschaft, St. Gallen, Switzerland.
 Nicaise, Prof. Paris, France.
 Nordisk Medicinski Archiv, Stockholm, Sweden.
 Paschall, Frank Chihuahua, Mex.
 Provincial Med. Journal, Halifax, Yorkshire, Eng.
 Recueil des Memoires de Medecin de Chirurgie et de Pharmacie Militaire, Paris, France.
 Revista Argentina de Ciencias Medicas, Buenos Ayres, Argentine Republic.
 Revista Brasileira de Medicinae, Rio de Janeiro, Brazil.
 Revista de Ciencias Medicas, Habana, Cuba.
 Revista Medica Bogota, Colombia.
 Revista Medica de Chili Santiago, Chili.
 Revista Medica de Mexico, City of Mexico, Mex.
 Revue de Laryngologie Bordeaux, France.
 Rev. Med. e Chirurg Oporto, Portugal.
 Rivista Internaz di Medicina e Chirurgia, Naples, Italy.
 Sanitary Record London, Eng.
 Schlesische Gessellschaft fur Vaterlandische, Breslan, Ger.
 St. Petersburg Medicinische Wochenschrift, St. Petersburg, Russia.
 The Asclepiad London, Eng.
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 Tidsskrift for Praktisk Medicin, Kristiana, Norway.
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